STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

APPLICABLE STANDARDS
BOOK 3
I-15/I-215 Interchange Improvements
(Devore)

FOR DESIGN AND CONSTRUCTION ON STATE HIGHWAY

On I-15 from 0.8 mile south of Glen Helen Parkway UC to 1.4 mile north of Kenwood Ave UC.
And
On I-215 from 1.2 mile south of Devore Road OC to the I-15 junction

DISTRICT 08, ROUTE I-15/I-215

CONTRACT NO. 08-0K7104
08-SBD-I-15 PM 14.0/R16.4, I-215 PM 16.0/17.8
Project ID 08000003664

Federal Aid Project
Xxxxxxxx
Dated: April 17, 2012
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<td>EMBANK- A Microcomputer Program to Determine One-Dimensional Compression Due to Embankment Loads FHWA-SA-92-045</td>
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<td>482</td>
<td>Institute of Transportation Engineering (ITE)</td>
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<td>December 2008</td>
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### Index of Standards, Manuals, Guidelines and References

**Availability Legend**
- **E** = Document to be given to Contractor in electronic format
- **IS** = Industry Standard – Contractor’s responsibility to acquire
- **W** = Web download on the organization’s website – Contractor’s responsibility to acquire

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<td>US Army Corps of Engineers (COE)</td>
<td>Methods Used in Tieback Wall Design and Construction to Prevent Local Anchor Failure, Progressive Anchorage Failure, and Ground Mass Stability Failure</td>
<td>December 2002</td>
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<td>June 8, 2007</td>
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2 MODIFICATIONS TO DEPARTMENT (CALTRANS) MANUALS

The following notes apply to the Caltrans Manuals used on this Project:

1. The Department (Caltrans) Manuals were created as an internal guidance document for use by various Department (Caltrans) personnel. As such, the Manuals are written as a guidance documents and not as mandatory requirements. For purposes of design-build projects, the Design-Builder shall assume that all provisions of the Manual, including the figures and tables, are mandatory and guidelines shall be assumed to be requirements. All words such as “should,” “may,” “must,” “might,” “could,” and “can” shall mean “shall” unless the context requires otherwise, as determined in the sole discretion of Department. The Design-Builder shall disregard qualifying words such as “usually,” “normally,” and “generally.” It shall be in Department’s sole discretion to determine when the context does not require a provision to be mandatory.

2. Department (Caltrans) Manuals are standard documents for use by Department (Caltrans) personnel. For purposes of design-build projects, the Design-Builder shall assume that all of the provisions of the Standards are requirements.

3. Individual manuals are available in electronic format. All the Department (Caltrans) manuals can be accessed at the following Web Site: http://caltrans-opac.ca.gov/publicat.htm

4. If the department (Caltrans) Manual expires during the course of the Project the Design-Builder shall contact Department to determine if they should continue to use the manual or if it will be replaced.

5. Any references related to pay items or quantities, measurement for payment, method of measurement, basis of payment, extra work, adjustment of unit prices, or similar phrases shall be disregarded by the Design-Builder, since the Contract Price is full compensation for the Work.

6. No changes have been made to provisions in the Manual that do not apply to design-build contracts, but that provide general information (e.g., descriptions of Department (Caltrans) divisions and their duties, descriptions of legal authority, or descriptions of internal Department (Caltrans) procedures); however, in some cases it may not be clear whether rights or responsibilities are applicable to the Design-Builder. If it is unclear whether specific provisions in the Manual are applicable to the Design-Builder, the Design-Builder shall raise the issue with Department and Department shall make that determination in its sole discretion.

7. The Design-Builder shall disregard the paragraphs within the manuals relating to questions. All questions shall be taken to the Department’s Contract Manager.

8. All references to the Engineer shall mean the Design-Builder unless otherwise directed by Department.

9. All references to the Agency shall mean Department (Caltrans), unless noted otherwise.

10. All references to Caltrans shall mean the Design-Builder, unless otherwise noted.

11. All references to Caltrans offices and personnel shall mean the Design-Builder’s similar offices and personnel.

12. When the Manual refers to an action being necessary or needed, the Design-Builder shall construe the action as required unless the context requires otherwise, as determined in the sole discretion of Department.
13. In addition, phrases relating to items such as activity[ies] that “will be” conducted, that are “most easily accomplished by”, that “are recommended”, that “is usually necessary”, that “should preferably be” done, that “might require”, that “is necessary” or “as necessary”, that “are” (or “is”) “required” or “done” shall be construed to be mandatory requirements unless the context requires otherwise, as determined in the sole discretion of Department. Phrases relating to problems with activity[ies] that should not be conducted, such as “is not normally used,” “is not good practice,” “should never be done,” “cannot be used,” or “should be avoided” shall be construed as prohibited. It shall be in Department’s sole discretion to determine when the context either requires or does not require a provision to be mandatory.

14. Where the notes refer to items that are indicated in the plans or special provisions or required in the plans or special provisions, the plans or special provisions shall mean the Design-Builder’s plans or special provisions.

15. Where the notes refer to the Engineer, they shall mean the Design-Builder unless otherwise specified below.

16. When the Manual refers to other manuals, the version of these manuals applicable to this design-build project is the version current at the time of the date of this Invitation. For Bid (IFB) unless modified by Addendum or Change Order.

17. References to approved products or materials shall mean Approved by Caltrans.

18. References to payment, pay items and quantities are hereby deleted.

19. All references to the Inspector, the Field Inspector, the Project Engineer, the Engineer, the Materials Engineer, the District Materials Engineer, the Survey Crew, the Project Supervisor, the Agency Certified Technician, the Certified Plant Technician, and the Representative of the Office of Materials shall mean the Design-Builder, unless noted otherwise.

20. All references to the Department (Caltrans) facilities, including the Office of Materials Laboratory, Central Laboratory, Cement Laboratory, Concrete & Metals Laboratory, Aggregate Laboratory, Chemical Laboratory, Mix Design Laboratory, District Laboratory, and the Laboratory shall mean the Design-Builder’s similar Laboratory facilities, unless noted otherwise.

21. The Design-Builder shall use forms as required to report the same information and in the same format as the Caltrans forms shown in the Manuals.

22. The Design-Builder shall complete all laboratory testing at a Department certified and approved facility with current AASHTO Materials Reference Laboratory (AMRL) certification.
3 MODIFICATIONS TO TECHNICAL MEMORANDA
(NOT USED)
4 DESIGN-BUILD MODIFICATIONS TO THE CALTRANS STANDARD SPECIFICATIONS 2010 EDITION

General

These Contract Provisions are a revised version of the Caltrans Standard Specifications 2010 Edition and contain requirements generally applicable to the Work to be performed by Design-Builder. In certain cases provisions in the Standard Specifications have been superseded by other provisions of the Contract Documents. For ease of reference, this document uses the same section numbers as the Standard Specifications and identifies provisions of the Contract Documents that have replaced or modified the standard clauses. If there are conflicts between the “General” Modifications and the Specific Modifications below, the Specific Modifications have precedence over the General Modifications. If the Design-Builder believes that a modification is unclear, the Design-Builder shall have the obligation to raise the issue with Department. Regardless of whether the Design-Builder raises the issue, Department shall always have the right to notify the Design-Builder if the Design-Builder is interpreting the modification incorrectly. Any references to other standards, codes, or criteria, or to the latest version of other standards, codes, or criteria in the Project Requirements of the Contract Documents shall mean the latest version as of the Request for Proposals (RFP) issue date. Those standard specifications that are left blank are not modified in this Modification document, but they may be modified by Special Provisions or other Contract Documents. All Sections are incorporated herein, except as otherwise provided in the Contract Documents, and with the following general and specific exceptions:

General Exceptions:

1. When these Specifications refer to “Measurement for Payment,” “Method of Measurement,” or “Payment Quantities,” such language shall be disregarded. It is not the intent of the Design-Build Contract that the various components of the Work will be measured for payment. Final payment will be at the Contract Price for the completed Project irrespective of the quantities of the various components incorporated in the Work.

2. When these Specifications refer to “basis of payment,” “unit prices,” or “adjustments of unit prices,” such references and language shall be disregarded, except unit prices as identified in the Project Requirements, applicable to disincentives for Nonconforming Work or incentives for surface ride quality shall be either the specific dollar amount set forth in the standard specifications or a unit price proposed by the Design-Builder and Approved by Department.

3. When these Specifications refer to “extra work,” “compensation for,” “at the Department’s expense,” “quantity adjustments,” “equivalent quantities,” or similar phrases, such references shall be disregarded. It is intended that the payment of the Contract Price will be full compensation for all Work performed pursuant to the Design-Build Contract unless specific provisions for additional payments are contained in the Contract Documents. An exception to this general exclusion will be the provisions of Sections 10 thru 99, as modified by the Special Provisions, relating to incentives for surface ride quality and disincentives for Nonconforming Work.

4. When these specifications refer to the term “Special Provision,” such term shall mean Contract Documents.

5. When these specifications refer to the term “incidental” such term shall mean that the costs shall be included in the Design-Builder’s Price Proposal.
A. Section 1 through 9 - General Provisions – Specific Modifications

Section 1 General

1-1.01 GENERAL
This section is applicable to this project.

1-1.02 STYLE VARIATIONS
This section is applicable to this project.

1-1.03–1-1.04 RESERVED

1-1.05 REFERENCES
This section is deleted in its entirety. Provisions regarding “References” in this section are set forth in Book 1, Section 1 “Contract Components; Interpretation of Contract Documents” of the Contract Documents.

1-1.06 ABBREVIATIONS
This section is applicable to this project.

1-1.07 DEFINITIONS
1-1.07A General
Interpret terms as defined in the Contract documents. References to “Bid Item List” shall mean Price Proposal.

1-1.07B Glossary
This section is applicable to this project.

1-1.08 DISTRICTS
This section is applicable to this project.

1-1.09 FREEZE-THAW AREAS
This section is applicable to this project.

1-1.10 RESERVED

1-1.11 WEB SITES, ADDRESSES, AND TELEPHONE NUMBERS
This section is applicable to this project.

1-1.12 MISCELLANY
Make checks and bonds payable to the Department of Transportation.

1-1.13–1-1.15 RESERVED
Section 2 Bidding

This section is deleted in its entirety. Provisions regarding “Bidding” are set forth in the Instructions to Proposers (ITP) of the Contract Documents.
Section 3 Contract Award and Execution

This section is deleted in its entirety. Provisions regarding “Contract Award and Execution” are set forth in the Instruction to Proposers of the Contract Documents.
Section 4 Scope of Work

4-1.01 GENERAL
Section 4 includes specifications related to the scope of work.

4-1.02 INTENT
The Contract intent is to provide for work completion using the best general practices.
Nothing in the specifications voids the Contractor's public safety responsibilities.

4-1.03 WORK DESCRIPTION
This section is deleted in its entirety. Provisions regarding “Work Description” in this section are set forth in the Contract Documents.

4-1.04 USE OF MATERIALS FOUND ON THE JOB SITE
This section is deleted in its entirety. Any materials required to be removed from the Project shall become the property of the Design-Builder and shall be disposed of at an appropriate off-site disposal facility provided by the Design-Builder unless otherwise provided in the Contract Documents.

4-1.05 CHANGES AND EXTRA WORK
4-1.05A General
This section is deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

4-1.05B Work-Character Changes
This section is deleted in its entirety. Provisions regarding “Work-Character Changes” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

4-1.06 DIFFERING SITE CONDITIONS (23 CFR 635.109)
4-1.06A General
Reserved

4-1.06B Contractor's Notification
This section is deleted in its entirety. Provisions regarding “Contractor’s Notification” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

4-1.06C Engineer's Investigation and Decision
This section is deleted in its entirety. Provisions regarding “Engineer’s Investigation and Decision” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

4-1.07 VALUE ENGINEERING
4-1.07A General
Reserved

4-1.07B Value Engineering Change Proposal
This section is deleted in its entirety.

4-1.07C Value Analysis Workshop
This section is deleted in its entirety.
4-1.08–4-1.12 RESERVED

4-1.13 CLEANUP

This section is deleted in its entirety. Provisions regarding “Cleanup” in this section are set forth in Book 1, Section 20 “Acceptance of Project” of the Contract Documents.
Section 5 Control of Work

5-1.01 GENERAL
This section is applicable to this project.

5-1.02 CONTRACT COMPONENTS
This section is hereby deleted in its entirety. Provisions regarding “Contract Components” in this section are set forth in the Book 1, Section 1 Contract Components; Interpretation of Contract Documents.

5-1.03 ENGINEER'S AUTHORITY
This section is hereby deleted in its entirety. Provisions regarding “Engineer’s Authority” in this section are set forth in Book 1, Section 5 “Control of Work” of the Contract Documents. Department has the authority by written order to suspend the Work wholly or in part for the reasons delineated in Book 1, Section 15 “Termination for Convenience” of the Contract Documents. Failure to enforce a contract provision does not waive enforcement of any contract provision.

5-1.04–5-1.05 RESERVED

5-1.06 PROTESTS
This section is hereby deleted in its entirety. Provisions regarding “Protests” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.07–5-1.08 RESERVED

5-1.09 PARTNERING
5-1.09A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.09B Partnering Facilitator, Workshops, and Monthly Evaluation Surveys
This section is hereby deleted in its entirety. Provisions regarding “Partnering Facilitator, Workshops, and Monthly Evaluation Surveys” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.09C Training in Partnering Skills Development
This section is hereby deleted in its entirety. Provisions regarding “Training in Partnering Skills Development” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.09D Payment
This section is hereby deleted in its entirety. Provisions regarding “Payment” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.10–5-1.11 RESERVED

5-1.12 ASSIGNMENT
This section is hereby deleted in its entirety. Provisions regarding “Assignment” in this section are set forth in Book 1, Section 23 “Miscellaneous Provisions” of the Contract Documents.

5-1.13 SUBCONTRACTING
5-1.13A General
This section is applicable to this project.
5-1.13B Disadvantaged Business Enterprises
5-1.13B(1) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 7 “Equal Employment opportunity; Subcontracts; Labor” of the Contract Documents.

5-1.13B(2) Underutilized Disadvantaged Business Enterprises
This section is hereby deleted in its entirety. Provisions regarding “Underutilized Disadvantaged Business Enterprises” in this section are set forth in Book 1, Section 7 “Equal Employment opportunity; Subcontracts; Labor” of the Contract Documents.

5-1.13C Disabled Veteran Business Enterprises
This section is hereby deleted in its entirety.

5-1.13D Non–Small Businesses
This section is hereby deleted in its entirety.

5-1.13E–5-1.13I Reserved
5-1.14–5-1.15 RESERVED
5-1.16 REPRESENTATIVE
This section is hereby deleted in its entirety. Provisions regarding “Representative” in this section are set forth in Book 1, Section 23 “Miscellaneous Provisions” of the Contract Documents.

5-1.17 CHARACTER OF WORKERS
This section is hereby deleted in its entirety. Provisions regarding “Character of Workers” in this section are set forth in Book 1, Section 7 “Equal Employment opportunity; Subcontracts; Labor” of the Contract Documents.

5-1.18–5.19 RESERVED
5-1.20 COORDINATION WITH OTHER ENTITIES
5-1.20A General
This section is applicable to this project.

5-1.20B Permits, Licenses, Agreements, and Certifications
5-1.20B(1) General
This section is applicable to this project.

5-1.20B(2) Before Award
This section is applicable to this project.

5-1.20B(3) After Award
This section is applicable to this project.

5-1.20B(4) Contractor–Property Owner Agreement
This section is applicable to this project.

5-1.20C Railroad Relations
Reserved
5-1.20D–5-1.20F Reserved
5-1.21–5-1.22 RESERVED
5-1.23 SUBMITTALS

5-1.23A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 2, Section 2 “Project Management” of the Contract Documents.

5-1.23B Action Submittals
5-1.23B(1) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 2, Section 2 “Project Management” of the Contract Documents.

5-1.23B(2) Shop Drawings
This section is hereby deleted in its entirety. Provisions regarding “Shop Drawings” in this section are set forth in Book 2, Section 2 “Project Management” and Section 13 “Structures” of the Contract Documents.

5-1.23B(3) Product Data
Reserved

5-1.23B(4) Samples
Reserved

5-1.23B(5) Test Samples
This section is applicable to this project.

5-1.23B(6) Quality Control Plans
This section is hereby deleted in its entirety. Provisions regarding “Quality Control Plans” in this section are set forth in Book 2, Section 2 “Project Management” of the Contract Documents.

5-1.23B(7) Work Plans
Reserved

5-1.23C Informational Submittals
This section is applicable to this project.

5-1.24–5-1.25 RESERVED

5-1.26 CONSTRUCTION SURVEYS
This section is hereby deleted in its entirety. Provisions regarding “Construction Surveys” in this section are set forth in Book 2, Section 9 “Land Surveying” of the Contract Documents.

5-1.27 RECORDS
5-1.27A General
Reserved

5-1.27B Record Retention
This section is hereby deleted in its entirety. Provisions regarding “Record Retention” in this section are set forth in Book 1, Section 22 “Documents and Records” of the Contract Documents.

5-1.27C Record Inspection, Copying, and Auditing
This section is hereby deleted in its entirety. Provisions regarding “Record Inspection, Copying, and Auditing” in this section are set forth in Book 1, Section 22 “Documents and Records” of the Contract Documents.
5-1.27D Cost Accounting Records
This section is hereby deleted in its entirety. Provisions regarding “Cost Accounting Records” in this section are set forth in Book 1, Section 22 “Documents and Records” of the Contract Documents.

5-1.27E Change Order Bills
This section is hereby deleted in its entirety. Provisions regarding “Change Order Bills” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.28–5-1.29 RESERVED

5-1.30 Noncompliant and Unauthorized Work
This section is hereby deleted in its entirety. Provisions regarding “Noncompliant and Unauthorized Work” in this section are set forth in Book 1, Section 5 “Control of Work” of the Contract Documents.

5-1.31 Job Site Appearance
This section is applicable to this project.

5-1.32 Areas for Use
This section is applicable to this project. References to Section 7-1.05 shall mean Book 1, Section 18 “Indemnification” of the Contract Documents.

5-1.33 Equipment
This section is applicable to this project.

5-1.34–5-1.35 RESERVED

5-1.36 Property and Facility Preservation
5-1.36A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 10 “Risk of Loss” of the Contract Documents.

5-1.36B Landscape
This section is applicable to this project.

5-1.36C Railroad Property
This section is hereby deleted in its entirety. Provisions regarding “Railroad Property” in this section are set forth in Book 1, Section 2 “Obligations of Design-Builder” of the Contract Documents.

5-1.36D Nonhighway Facilities
This section is applicable to this project.

5-1.37 Maintenance and Protection
5-1.37A General
This section is applicable to this project.

5-1.37B Load Limits
5-1.37B(1) General
This section is applicable to this project.5-1.37B(2) Increased Load Carrying Capacity
This section is applicable to this project.

5-1.37B(3) Material Hauling Equipment Lane on Bridges
This section is applicable to this project.
5-1.38 MAINTENANCE AND PROTECTION RELIEF
This section is hereby deleted in its entirety. Provisions regarding “Maintenance and Protection Relief” in this section are set forth in Book 1, Section 10 “Risk of Loss” of the Contract Documents.

5-1.39 DAMAGE REPAIR AND RESTORATION

5-1.39A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 10 “Risk of Loss” of the Contract Documents.

5-1.39B Damage Caused by an Act of God
This section is hereby deleted in its entirety. Provisions regarding “Damage Caused by an Act of God” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.39C Landscape Damage
5-1.39C(1) General
This section is applicable to this project.

5-1.39C(2) Plant Establishment Period of 3 Years or More
This section is applicable to this project.

5-1.40–5-1.41 RESERVED

5-1.42 REQUESTS FOR INFORMATION
This section is applicable to this project.

5-1.43 POTENTIAL CLAIMS AND DISPUTE RESOLUTION

5-1.43A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 13 “Changes in the Work” and Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43B Initial Potential Claim Record
This section is hereby deleted in its entirety. Provisions regarding “Initial Potential Claim Record” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.43C Supplemental Potential Claim Record
This section is hereby deleted in its entirety. Provisions regarding “Supplemental Potential Claim Record” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.43D Full and Final Potential Claim Record
This section is hereby deleted in its entirety. Provisions regarding “Full and Final Potential Claim Record” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

5-1.43E Alternative Dispute Resolution
5-1.43E(1) General

5-1.43E(1)(a) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.
5-1.43E(1)(b) Establishment of Procedures
This section is hereby deleted in its entirety. Provisions regarding “Establishment of Procedures” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(1)(c) Dispute Meetings
This section is hereby deleted in its entirety. Provisions regarding “Dispute Meetings” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(1)(d) Informal Dispute Meetings
This section is hereby deleted in its entirety. Provisions regarding “Informal Dispute Meetings” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(1)(e) Recommendations
This section is hereby deleted in its entirety. Provisions regarding “Recommendations” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(1)(f) Completion of Alternative Dispute Resolution
This section is hereby deleted in its entirety. Provisions regarding “Completion of Alternative Dispute Resolution” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(1)(g) Payment
This section is hereby deleted in its entirety. Provisions regarding “Payment” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(2) Dispute Resolution Advisor

5-1.43E(2)(a) General
This section is not applicable and hereby deleted in its entirety.

5-1.43E(2)(b) DRA Selection
This section is not applicable and hereby deleted in its entirety.

5-1.43E(2)(c) DRA Replacement
This section is not applicable and hereby deleted in its entirety.

5-1.43E(2)(d) DRA Traditional Dispute Meeting
This section is not applicable and hereby deleted in its entirety.

5-1.43E(3) Dispute Resolution Board

5-1.43E(3)(a) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(3)(b) DRB Member Selection
This section is hereby deleted in its entirety. Provisions regarding “DRB Member Selection” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.
5-1.43E(3)(c) DRB Member Replacement
This section is hereby deleted in its entirety. Provisions regarding “DRB Member Replacement” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(3)(d) DRB Progress Meetings
This section is hereby deleted in its entirety. Provisions regarding “DRB Progress Meeting” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43E(3)(e) DRB Traditional Dispute Meeting
This section is hereby deleted in its entirety. Provisions regarding “DRB Traditional Dispute Meeting” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.

5-1.43F Reserved

5-1.44–5-1.45 RESERVED

5-1.46 FINAL INSPECTION AND CONTRACT ACCEPTANCE
This section is hereby deleted in its entirety. Provisions regarding “Final Inspection and Contract Acceptance” in this section are set forth in Book 1, Section 20 “Acceptance of Project” of the Contract Documents.

5-1.47–5-1.50 RESERVED
Section 6 Control of Material

6-1 GENERAL

6-1.01 GENERAL
Section 6 includes specifications related to control of materials.

6-2 MATERIAL SOURCE

6-2.01 GENERAL
This section is applicable to this project.

6-2.02 MATERIAL SOURCE
This section is applicable to this project.

6-2.03 DEPARTMENT-FURNISHED MATERIALS
This section is applicable to this project.

6-2.04 LOCAL MATERIALS
This section is hereby deleted in its entirety. Provisions regarding “Local Materials” in this section are set forth in Book 1, Section 5 “Control of Work” of the Contract Documents.

6-2.05 BUY AMERICA

6-2.05A General
Reserved

6-2.05B Crumb Rubber (Pub Res Code § 42703(D))
This section is applicable to this project.

6-2.05C Steel and Iron Materials (23 CFR 635.410)
This section is applicable to this project.

6-3 QUALITY

6-3.01 GENERAL
This section is applicable to this project.

6-3.02 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION
This section is hereby deleted in its entirety.

6-3.03 AUTHORIZED LABORATORY LISTS
This section is applicable to this project.

6-3.04 QUALITY CONTROL
This section is applicable to this project.

6-3.05 QUALITY ASSURANCE

6-3.05A General
This section is applicable to this project.

6-3.05B Source Inspection Expense Deductions
This section is applicable to this project.

6-3.05C Material Source Inspection and Testing
This section is applicable to this project.
6-3.05D  Job Site Inspection and Testing
This section is applicable to this project.

6-3.05E  Certificates of Compliance
This section is applicable to this project.

6-3.05F  Test Data, Test Reports, and Evaluation Reports
Reserved

6-3.05G  Test Samples
This section is applicable to this project.

6-3.05H  Reserved

6-3.05I  Authorized Facility Audit Lists
This section is applicable to this project.

6-3.05J  Quality Control Plans
Reserved

6-3.05K  Authorized Material Lists
This section is applicable to this project.

6-3.05L  Authorized Material Source Lists
This section is applicable to this project.

6-3.06  GUARANTEE
This section is hereby deleted in its entirety. Provisions regarding “Guarantee” in this section are set forth in Book 1, Section 21 “Warranties” of the Contract Documents.
Section 7 Legal Relations and Responsibility to the Public

7-1.01 GENERAL
This Section is applicable to this project.

7-1.02 LAWS
7-1.02A General
This section is applicable to this project.

7-1.02B U.S. Fair Labor Standards Act
This section is applicable to this project.

7-1.02C Emissions Reduction
This section is applicable to this project.

7-1.02D–7-1.02H Reserved

7-1.02I Government Code
7-1.02I(1) General
Reserved

7-1.02I(2) Nondiscrimination
This section is applicable to this project.

7-1.02J Reserved

7-1.02K Labor Code
7-1.02K(1) General
This section is applicable to this project.

7-1.02K(2) Wages
This section is applicable to this project.

7-1.02K(3) Certified Payroll Records (Labor Code § 1776)
This section is applicable to this project.

7-1.02K(4) Apprentices
This section is applicable to this project.

7-1.02K(5) Working Hours
This section is applicable to this project.

7-1.02K(6) Occupational Safety and Health Standards
7-1.02K(6)(a) General
This section is applicable to this project.

7-1.02K(6)(b) Excavation Safety
This section is applicable to this project.

7-1.02K(6)(c) Tunnel Safety
This section is applicable to this project.

7-1.02K(6)(d) Confined Space Safety
This section is applicable to this project.
7-1.02K(6)(e)–7-1.02K(6)(i) Reserved

7-1.02K(6)(j) Lead Safety
7-1.02K(6)(j)(i) General
Reserved

7-1.02K(6)(j)(ii) Lead Compliance Plan
This section is applicable to this project.

7-1.02K(6)(j)(iii–viii) Reserved

7-1.02K(6)(k)–7-1.02K(6)(t) Reserved

7-1.02L Public Contract Code
7-1.02L(1) General
Reserved

7-1.02L(2) Antitrust Claims
This section is applicable to this project.

7-1.02M Public Resources Code
7-1.02M(1) General
Reserved

7-1.02M(2) Reserved

7-1.02M(3) Surface Mining and Reclamation Act
This section is applicable to this project.

7-1.02M(4)–7-1.02M(7) Reserved
7-1.02N Reserved

7-1.02O Vehicle Code
This section is applicable to this project.

7-1.02P–7-1.02Q Reserved

7-1.02R Environmental Stewardship
This section is applicable to this project.

7-1.02S–7-1.02Z Reserved

7-1.03 PUBLIC CONVENIENCE
Provisions regarding “Public Convenience” are applicable to this project except when these Specifications refer to “extra work,” “compensation for,” “at the Department’s expense,” “quantity adjustments,” “equivalent quantities,” or similar phrases, such references shall be disregarded. It is the intent that the payment of the Contract Price will be full compensation for all Work performed pursuant to the Design-Build Contract unless specific provisions for additional payments are contained in the Contract Documents.

7-1.04 PUBLIC SAFETY
Provisions regarding “Public Safety” are applicable to this project, with the modifications noted below. When these provisions refer to Section 5-1.02 “Contract Components,” this means Book 1, Section 1 “Contract Components; Interpretation of Contract Documents.”

Replace “20 days” in the 14th paragraph of this section with: 25 days.
Replace “90 days” in the 14th paragraph of this section with: 125 days.

Add between the 18th and 19th paragraph of this section:

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

7-1.05 INDEMNIFICATION

7-1.05A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 18 “Indemnification” of the Contract Documents.

7-1.05B Responsibility to Other Entities
This section is hereby deleted in its entirety. Provisions regarding “Responsibility to Other Entities” in this section are set forth in Book 1, Section 18 “Indemnification” of the Contract Documents.

7-1.06 INSURANCE

7-1.06A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06B Casualty Insurance
This section is hereby deleted in its entirety. Provisions regarding “Casualty Insurance” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06C Workers' Compensation and Employer's Liability Insurance
This section is hereby deleted in its entirety. Provisions regarding “Worker’s Compensation and Employer’s Liability Insurance” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06D Liability Insurance

7-1.06D(1) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06D(2) Liability Limits/Additional Insureds
This section is hereby deleted in its entirety. Provisions regarding “Liability Limits/Additional Insureds” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06D(3) Contractor's Insurance Policy is Primary
This section is hereby deleted in its entirety. Provisions regarding “Contractor’s Insurance Policy is Primary” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06E Automobile Liability Insurance
This section is hereby deleted in its entirety. Provisions regarding “Automobile Liability Insurance” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.
7-1.06F Policy Forms, Endorsements, and Certificates
This section is hereby deleted in its entirety. Provisions regarding “Policy Forms, Endorsements, and Certificates” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06G Deductibles
This section is hereby deleted in its entirety. Provisions regarding “Deductibles” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06H Enforcement
This section is hereby deleted in its entirety. Provisions regarding “Enforcement” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.06I Self-Insurance
This section is hereby deleted in its entirety. Provisions regarding “Self-Insurance” in this section are set forth in Book 1, Section 9 “Insurance” of the Contract Documents.

7-1.07 LEGAL ACTIONS AGAINST THE DEPARTMENT
7-1.07A General
This section is applicable to this project.

7-1.07B Seal Coat Claims
This section is hereby deleted in its entirety.

7-1.08 PERSONAL LIABILITY
This section is hereby deleted in its entirety. Provisions regarding “Personal Liability” in this section are set forth in Book 1, Section 23 “Miscellaneous Provisions” of the Contract Documents.

7-1.09–7-1.10 RESERVED
7-1.11 FEDERAL LAWS FOR FEDERAL-AID CONTRACTS
7-1.11A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, “Exhibit D – Federal Laws for Federal-Aid Contracts” of the Contract Documents.

7-1.11B FHWA-1273
This section is hereby deleted in its entirety. Provisions regarding “FHWA-1273” in this section are set forth in Book 1, “Exhibit D – Federal Laws for Federal-Aid Contracts” of the Contract Documents.

7-1.11C Female and Minority Goals
This section is hereby deleted in its entirety. Provisions regarding “Female and Minority Goals” in this section are set forth in Book 1, “Exhibit D – Federal Laws for Federal-Aid Contracts” of the Contract Documents.

7-1.11D Training
This section is hereby deleted in its entirety. Provisions regarding “Training” in this section are set forth in Book 1, “Exhibit D – Federal Laws for Federal-Aid Contracts” of the Contract Documents.
Section 8 Prosecution and Progress

8-1.01 GENERAL
Section 8 includes specifications related to prosecuting the Contract and work progress.

8-1.02 SCHEDULE
8-1.02A General
This section is hereby deleted in its entirety.

8-1.02B Level 1 Critical Path Method Schedule
8-1.02B(1) General
This section is hereby deleted in its entirety.

8-1.02B(2) Schedule Format
This section is hereby deleted in its entirety.

8-1.02B(3) Updated Schedule
This section is hereby deleted in its entirety.

8-1.02C Level 2 Critical Path Method Schedule
8-1.02C(1) General
This section is hereby deleted in its entirety.

8-1.02C(2) Schedule Format
This section is hereby deleted in its entirety.

8-1.02C(3) Computer Software
8-1.02C(3)(a) General
This section is hereby deleted in its entirety.

8-1.02C(3)(b) Computer Software Training
This section is hereby deleted in its entirety.

8-1.02C(4) Data and Network Diagrams
This section is hereby deleted in its entirety.

8-1.02C(5) Baseline Schedule
This section is hereby deleted in its entirety.

8-1.02C(6) Updated Schedule
This section is hereby deleted in its entirety.

8-1.02C(7) Final Updated Schedule
This section is hereby deleted in its entirety.

8-1.02D Level 3 Critical Path Method Schedule
8-1.02D(1) General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(2) Schedule Format
This section is hereby deleted in its entirety. Provisions regarding “Schedule Format” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.
8-1.02D(3)  Computer Software
This section is hereby deleted in its entirety. Provisions regarding “Computer Software” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(4)  Data, Network Diagrams, and Reports
This section is hereby deleted in its entirety. Provisions regarding “Data, Network Diagrams, and Reports” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(5)  Preconstruction Scheduling Conference
This section is hereby deleted in its entirety. Provisions regarding “Preconstruction Scheduling Conference” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(6)  Baseline Schedule
This section is hereby deleted in its entirety. Provisions regarding “Baseline Schedule” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(7)  Updated Schedule
This section is hereby deleted in its entirety. Provisions regarding “Updated Schedule” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(8)  Time Impact Analysis
8-1.02D(8)(a)  General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(8)(b)  Department-Owned Float
This section is hereby deleted in its entirety. Provisions regarding “Department-Owned Float” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(8)(c)  Ordered Changes
This section is hereby deleted in its entirety. Provisions regarding “Ordered Changes” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(9)  Final Updated Schedule
This section is hereby deleted in its entirety. Provisions regarding “Final Updated Schedule” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.02D(10)  Payment
This section is hereby deleted in its entirety. Provisions regarding “Payment” are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

8-1.02E–8-1.02F  Reserved

8-1.03  PRECONSTRUCTION CONFERENCE
This section is deleted in its entirety. Provisions regarding “Preconstruction Conference” in this section are set forth in Book 2, Section 2 “Project Management” of Contract Documents.

8-1.04  START OF JOB SITE ACTIVITIES
This section is hereby deleted in its entirety. Provisions regarding “Start of Job Site Activities” in this section are set forth in Book 1, Section 4 “Time within which Project shall be Completed; Scheduling” of the Contract Documents.
8-1.04A General
Reserved

8-1.04B Standard Start
This section is hereby deleted in its entirety.

8-1.04C Delayed Start
Reserved

8-1.04D Early Return-Early Start
Reserved

8-1.04E Next-Day Start
Reserved

8-1.04F–8-1.04J Reserved

8-1.05 TIME
This section is hereby deleted in its entirety. Provisions regarding “Time” in this section are set forth in Book 1, Section 4 “Time within which Project shall be Completed; Scheduling” of the Contract Documents.

8-1.06 SUSPENSIONS
This section is hereby deleted in its entirety. Provisions regarding “Suspensions” in this section are set forth in Book 1, Section 14 “Suspension of Work” of the Contract Documents.

8-1.07 DELAYS
8-1.07A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

8-1.07B Time Adjustments
This section is hereby deleted in its entirety. Provisions regarding “Time Adjustments” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

8-1.07C Payment Adjustments
This section is hereby deleted in its entirety. Provisions regarding “Payment Adjustments” in this section are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

8-1.08–8-1.09 RESERVED

8-1.10 LIQUIDATED DAMAGES
This section is hereby deleted in its entirety. Provisions regarding “Liquidated Damages” in this section are set forth in Book 1, Section 17 “Damages” of the Contract Documents.

8-1.11–8-1.12 RESERVED

8-1.13 CONTRACTOR'S CONTROL TERMINATION
This section is hereby deleted in its entirety. Provisions regarding “Contractor’s Control Termination” in this section are set forth in Book 1, Section 15 “Termination for Convenience” of the Contract Documents.
8-1.14 CONTRACT TERMINATION
This section is hereby deleted in its entirety. Provisions regarding “Contract Termination” in this section are set forth in Book 1, Section 15 “Termination for Convenience” and Section 16 “Default” of the Contract Documents.

8-1.15–8-1.16 RESERVED
Section 9 Payment

9-1.01 GENERAL
This section is applicable to this project.

9-1.02 MEASUREMENT
9-1.02A General
This section is hereby deleted in its entirety. Provisions regarding “General” in this section are hereby replaced with the following: The purpose of measurement of quantities is to identify Quality Control and Verification testing frequency requirements as contained in the Materials Control Schedule and in tracking production rates for monthly payments to the Design-Builder based on percentage complete. All specifications within the Caltrans Standard Specifications containing sections describing Method of Measurement and Basis of Payment shall have the sections describing Method of Measurement and Basis of Payment deleted. The Design-Builder hereby acknowledges and agrees that the single lump sum Contract Price constitutes full compensation for performance of all of the Work, subject only to those exceptions specified in the Contract Documents.

9-1.02B Weighing Equipment and Procedures
9-1.02B(1) General
This section is applicable to this project.

9-1.02B(2) Equipment
This section is applicable to this project.

9-1.02B(3) Procedures
This section is applicable to this project.

9-1.02C Final Pay Item Quantities
This section is hereby deleted in its entirety.

9-1.02D Quantities of Aggregate and Other Roadway Materials
This section is applicable to this project.

9-1.03 PAYMENT SCOPE
This section is hereby deleted in its entirety. Provisions regarding “Payment Scope” in this section are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

9-1.04 FORCE ACCOUNT
This section is applicable to this project.

9-1.04A General
This section is applicable to this project.

9-1.04B Labor
This section is applicable to this project.

9-1.04C Materials
This section is applicable to this project.

9-1.04D Equipment Rental
9-1.04D(1) General
This section is applicable to this project.
9-1.04D(2) Equipment On the Job Site
This section is applicable to this project.

9-1.04D(3) Equipment Not On the Job Site Required for Original-Contract Work
This section is applicable to this project.

9-1.04D(4) Equipment Not On the Job Site Not Required for Original-Contract Work
This section is applicable to this project.

9-1.04D(5) Non-Owner-Operated Dump Truck Rental
This section is applicable to this project.

9-1.05 EXTRA WORK PERFORMED BY SPECIALISTS
This section is hereby deleted in its entirety. Provisions regarding “Extra Work Performed by Specialists” are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

9-1.06 CHANGED QUANTITY PAYMENT ADJUSTMENTS
This section is hereby deleted in its entirety. Provisions regarding “Changed Quantity Payment Adjustments” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

9-1.07 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS
9-1.07A General
This section is hereby deleted in its entirety.

9-1.07B Asphalt Quantities
9-1.07B(1) General
Reserved

9-1.07B(2) Hot Mix Asphalt
This section is hereby deleted in its entirety.

9-1.07B(3) Rubberized Hot Mix Asphalt
This section is hereby deleted in its entirety.

9-1.07B(4) Modified Asphalt Binder in Hot Mix Asphalt
This section is hereby deleted in its entirety.

9-1.07B(5) Hot Mix Asphalt Containing Reclaimed Asphalt Pavement
This section is hereby deleted in its entirety.

9-1.07B(6) Tack Coat
This section is hereby deleted in its entirety.

9-1.07B(7) Asphaltic Emulsion
This section is hereby deleted in its entirety.

9-1.07B(8) Slurry Seal
This section is hereby deleted in its entirety.

9-1.07B(9) Modified Asphalt Binder
This section is hereby deleted in its entirety.

9-1.07B(10) Other Materials
This section is hereby deleted in its entirety.
9-1.07C Payment Adjustments
This section is hereby deleted in its entirety. Provisions regarding “Payment Adjustments” in this section are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

9-1.08–9-1.10 RESERVED

9-1.11 TIME-RELATED OVERHEAD

9-1.11A General
This section is applicable to this project.

9-1.11B Audit Examinations and Reports
This section is applicable to this project.

9-1.11C Payment
This section is applicable to this project.

9-1.12–9-1.14 RESERVED

9-1.15 WORK-CHARACTER CHANGES
This section is hereby deleted in its entirety. Provisions regarding “Work-Character Changes” in this section are set forth in Book 1, Section 13 “Changes in the Work” of the Contract Documents.

9-1.16 PROGRESS PAYMENTS
This section is hereby deleted in its entirety. Provisions regarding “Progress Payments” in this section are set forth in Book 1, Section 11 “Payment” and Book 2, Section “Project Management” of the Contract Documents.

9-1.16G–9-1.16M Reserved

9-1.17 PAYMENT AFTER CONTRACT ACCEPTANCE
This section is hereby deleted in its entirety. Provisions regarding “Payments after Contract Acceptance” in this section are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

9-1.18–9-1.20 RESERVED

9-1.21 CLERICAL ERRORS
This section is hereby deleted in its entirety. Provisions regarding “Clerical Errors” in this section are set forth in Book 1, Section 11 “Payment” of the Contract Documents.

9-1.22 ARBITRATION
This section is hereby deleted in its entirety. Provisions regarding “Arbitration” in this section are set forth in Book 1, Section 19 “Partnering, Dispute Resolution” of the Contract Documents.
B. Sections 10 through 99

General Modifications

1. On technical issues “The Engineer” shall mean the Design-Builder.
2. On Administrative issues “The Engineer” shall mean Department.

If the Design-Builder believes that a definition of “The Engineer” is unclear, the Design-Builder shall have the obligation to raise the issue with Department. Regardless of whether the Design-Builder raises the issue, Department shall always have the right to notify the Design-Builder if the Design-Builder is interpreting the definition of “The Engineer” incorrectly.

Specific Modifications

For any specific modifications on Section 10 through 99, please refer to the Exhibit 4-A, “Revised Standard Specifications – Section 10 to Section 99”.
EXHIBIT 4-A
Revised Standard Specifications - Section 10 to Section 99
DIVISION II  GENERAL CONSTRUCTION

10  GENERAL

Replace "Reserved" in section 10-1 with:

10-1.01  GENERAL
Reserved

10-1.02  WORK SEQUENCING
Before obliterating any traffic stripes, pavement markings, and pavement markers to be replaced at the same location, reference the stripes, markings, and markers. Include limits and transitions with control points to reestablish the new stripes, markings, and markers.

10-1.03  TIME CONSTRAINTS
Reserved

10-1.04–10-1.10  RESERVED

12  TEMPORARY TRAFFIC CONTROL

Replace section 12-7 with:

12-7  RESERVED

13  WATER POLLUTION CONTROL

Add to section 13-1.01A:

Comply with the Department's general permit issued by the State Water Resources Control Board for Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans). The Department's general permit governs stormwater and nonstormwater discharges from the Department's properties, facilities, and activities. The Department's general permit may be viewed at the Web site for the State Water Resources Control Board, Storm Water Program, Caltrans General Permit.
Add to the list in the 1st paragraph of section 13-1.01D(3)b:
3. Have completed SWRCB approved QSD training and passed the QSD exam

Add to the list in the 2nd paragraph of section 13-1.01D(3)b:
3. Have completed SWRCB approved QSP training and passed the QSP exam

15 EXISTING FACILITIES
01-20-12
Replace the 5th paragraph of section 15-5.06C(1) with:
01-20-12
New deck concrete surfaces must comply with section 51-1.03F(5) before starting overlay work.

DIVISION III  GRADING
19 EARTHWORK
01-20-12
Replace the 2nd paragraph of section 19-3.01A(2)(b) with:
07-01-11
For cofferdams on or affecting railroad property, allow 85 days for review.

Add to the list in the 1st paragraph of section 19-3.01A(2)(d):
01-20-12
9. Provisions for discontinuous rows of soil nails

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).

Replace the 1st paragraph of section 19-3.03E(3) with:
Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

**Replace the 2nd paragraph of section 19-3.03F with:**

Do not backfill over or place material over slurry cement backfill until 4 hours after placement. When concrete sand is used as aggregate and the in-place material is free draining, you may start backfilling as soon as the surface water is gone.

**Add between the 2nd and 3rd paragraphs of section 19-3.03K:**

Before you excavate for the installation of ground anchors in a wall zone:

1. Complete stability testing
2. Obtain authorization of test data

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

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:**

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:**

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.
5. Soil nail facing anchorages are attached or ground anchors are locked off.
DIVISION V  SURFACINGS AND PAVEMENTS
39 HOT MIX ASPHALT

Replace "less than 10 percent" in note "b" in the table titled "Aggregate Quality" of section 39-1.02E with:

10 percent or less

Add to the 1st paragraph of section 39-1.03A:

If RAP is used, use Laboratory Procedure LP-9.

Replace the 1st paragraph of section 39-1.03B with:

Perform a mix design that produces HMA with the values for the quality characteristics shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>HMA type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air void content (%)</td>
<td>California Test 367a</td>
<td>4.0</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min.)</td>
<td>LP-2</td>
<td>17.0</td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td>15.0</td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td></td>
<td>14.0</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>13.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>76.0–80.0</td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td>73.0–76.0</td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td></td>
<td>65.0–75.0</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>65.0–75.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion</td>
<td>LP-4</td>
<td>0.9–2.0</td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings</td>
<td></td>
<td>0.6–1.3</td>
</tr>
<tr>
<td>1/2&quot; and 3/4&quot; gradings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stabilometer value (min.) c</td>
<td>California Test 366</td>
<td>30</td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>1/2&quot; and 3/4&quot; gradings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Calculate the air void content of each specimen using California Test 309 and Laboratory Procedure LP-1.
b Voids in mineral aggregate for RHMA-G must be within this range.
c Alter California Test 304, Part 2.B.2.c: "After compaction in the compactor, cool to 140 ± 5 °F by allowing the briquettes to cool at room temperature for 0.5-hour, then place the briquettes in the oven at 140 °F from 2 to 3 hours.
d Report this value in the JMF submittal.
Replace item 4 in the list in the 1st paragraph of section 39-1.03C with:

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

Replace the 14th paragraph of section 39-1.03E with:

A verified JMF is valid for 12 months.

Replace the last sentence in the 15th paragraph of section 39-1.03E with:

This deduction does not apply to verifications initiated by the Engineer or JMF renewal.

Delete the 4th paragraph of section 39-1.03F.

Replace items 3 and 5 in the 6th paragraph of section 39-1.03F with:

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:

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:

**39-1.03G Job Mix Formula Modification**

For an accepted JMF, you may change 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 "Hot Mix Asphalt Mix Design Requirements"
2. Air void content at design value ±2.0 percent
3. Voids in mineral aggregate as shown in the table titled "Hot Mix Asphalt Mix Design Requirements"
4. Voids filled with asphalt if an adjustment for asphalt binder content TV is more than ±0.3 percent from the original OBC shown on the Contractor Asphalt Mix Design Data form.
5. Dust proportion if an adjustment for asphalt binder content TV is more than ±0.3 percent from OBC shown on the Contractor Asphalt Mix Design Data form.

If the modified JMF is verified, the Engineer revises your Hot Mix Asphalt Verification form to include the new 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:**

**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:**

3 business days

**Replace the 2nd sentence in the 2nd paragraph of section 39-1.04A with:**

During production, take samples under California Test 125. You may sample HMA from:

**Replace the 2nd paragraph of section 39-1.04E with:**

Sample RAP once daily and determine the RAP aggregate gradation under Laboratory Procedure LP-9 and submit the results with the combined aggregate gradation.
Replace "5 days" in the 1st paragraph of section 39-1.06 with:

5 business days

Replace the 3rd paragraph of section 39-1.08B with:

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:

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:

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:

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:

5 inches per 0.1-mile section

Add to section 39-1.12:

39-1.12E Reserved

Add to section 39-1.14:

Prepare the area to receive HMA for miscellaneous areas and dikes, including any excavation and backfill as needed.

Replace the 1st paragraph of section 39-2.02B with:

Perform sampling and testing at the specified frequency for the quality characteristics shown in the following table:
## Minimum Quality Control—Standard Construction Process

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum sampling and testing frequency</th>
<th>HMA type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RHMA-G</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OGFC</td>
</tr>
<tr>
<td>Aggregate gradation&lt;sup&gt;a&lt;/sup&gt;</td>
<td>California Test 202</td>
<td>1 per 750 tons and any remaining part at the end of the project</td>
<td>JMF ± Tolerance&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sand equivalent (min)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>California Test 217</td>
<td></td>
<td>47</td>
</tr>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>HMA moisture content (% max)</td>
<td>California Test 226 or 370</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
<td>1.0</td>
</tr>
<tr>
<td>Field compaction (% max. theoretical density)&lt;sup&gt;d,e&lt;/sup&gt;</td>
<td>QC plan</td>
<td>2 per business day (min.)</td>
<td>91–97</td>
</tr>
<tr>
<td>Stabilometer value (min)&lt;sup&gt;f&lt;/sup&gt;</td>
<td>California Test 366</td>
<td>One per 4,000 tons or 2 per 5 business days, whichever is greater</td>
<td>30</td>
</tr>
<tr>
<td>Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants&lt;sup&gt;h&lt;/sup&gt;</td>
<td>California Test 226 or 370</td>
<td>2 per day during production</td>
<td>--</td>
</tr>
<tr>
<td>Percent of crushed particles coarse aggregate (% min)</td>
<td>California Test 205</td>
<td>As designated in the QC plan. At least once per project</td>
<td>90</td>
</tr>
<tr>
<td>Los Angeles Rattler (% max)</td>
<td>California Test 211</td>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>

<sup>a</sup> California Test 202

<sup>b</sup> JMF ± Tolerance

<sup>c</sup> California Test 367

<sup>d</sup> JMF ± 0.45

<sup>e</sup> JMF ± Tolerance

<sup>f</sup> California Test 366

<sup>g</sup> JMF ± 0.45

<sup>h</sup> JMF ± Tolerance

<sup>i</sup> JMF ± 0.50

<sup>j</sup> JMF ± 0.50

<sup>k</sup> JMF ± 0.50

<sup>l</sup> JMF ± 0.50

<sup>m</sup> JMF ± 0.50
<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss at 100 rev.</td>
<td>12</td>
<td>--</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Flat and elongated particles (% max by weight @ 5:1)</td>
<td>California Test 235</td>
<td>Report only</td>
<td>Report only</td>
<td>Report only</td>
<td>Report only</td>
</tr>
<tr>
<td>Fine aggregate angularity (% min)</td>
<td>California Test 234</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>--</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>76.0–80.0</td>
<td>76.0–80.0</td>
<td>73.0–76.0</td>
<td>73.0–76.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>65.0–75.0</td>
<td>65.0–75.0</td>
<td>Report only</td>
<td>--</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)</td>
<td>LP-2</td>
<td>17.0</td>
<td>17.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.0</td>
<td>15.0</td>
<td>18.0–23.0</td>
<td>18.0–23.0</td>
</tr>
<tr>
<td>Dust proportion</td>
<td>LP-4</td>
<td>0.9–2.0</td>
<td>0.9–2.0</td>
<td>0.6–1.3</td>
<td>0.6–1.3</td>
</tr>
<tr>
<td>Smoothness</td>
<td>Section 39-1.12</td>
<td>12-foot straight-edge, must grind, and P0</td>
<td>12-foot straight-edge, must grind, and P0</td>
<td>12-foot straight-edge, must grind, and P0</td>
<td></td>
</tr>
<tr>
<td>Asphalt rubber binder viscosity @ 375 °F, centipoises</td>
<td>Section 39-1.02D</td>
<td>Section 39-1.04C</td>
<td>--</td>
<td>--</td>
<td>1,500–4,000</td>
</tr>
<tr>
<td>Asphalt modifier</td>
<td>Section 39-1.02D</td>
<td>Section 39-1.04C</td>
<td>--</td>
<td>--</td>
<td>Section 39-1.02D</td>
</tr>
<tr>
<td>CRM</td>
<td>Section 39-1.02D</td>
<td>Section 39-1.04C</td>
<td>--</td>
<td>--</td>
<td>Section 39-1.02D</td>
</tr>
</tbody>
</table>

* Determine combined aggregate gradation containing RAP under Laboratory Procedure LP-9.
* The tolerances must comply with the allowable tolerances in section 39-1.02E.
* Report the average of 3 tests from a single split sample.
* 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.
* California Test 375 is used to determine field compaction, except use:
  1. In-place density measurements using the method specified in your QC plan is used instead of using the nuclear gauge specified in Part 4 of California Test 375
  2. California Test 309 to determine the maximum theoretical density instead of determining maximum density as specified in Part 5 of California Test 375
* Alter California Test 304, Part 2.B.2.c: "After compaction in the mechanical compactor, cool to 140 ± 5 °F by allowing the briquettes to cool at room temperature for 0.5 hour, then place the briquettes in the oven at 140 °F for a minimum of 2 hours and not more than 3 hours."
* 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 if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from OBC value submitted on a Contractor Hot Mix Asphalt Design Data form.

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

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

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

<table>
<thead>
<tr>
<th>HMA Acceptance—Standard Construction Process</th>
<th>Test method</th>
<th>HMA type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality characteristic</td>
<td>Aggregate gradation</td>
<td>Test method</td>
</tr>
<tr>
<td>Sieve</td>
<td>California Test 202</td>
<td>JMF ± tolerance</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>No. 4</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>No. 8</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>No. 200</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sand equivalent (min)</td>
<td>California Test 217</td>
<td>47</td>
</tr>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td>JMF ± 0.45</td>
</tr>
<tr>
<td>HMA moisture content (% max)</td>
<td>California Test 226 or 370</td>
<td>1.0</td>
</tr>
<tr>
<td>Field compaction (% max. theoretical density)</td>
<td>California Test 375</td>
<td>91–97</td>
</tr>
<tr>
<td>Stabilometer value (min)</td>
<td>California Test 366</td>
<td>30</td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings</td>
<td>3/8&quot; and 3/4&quot; gradings</td>
<td>37</td>
</tr>
<tr>
<td>Air void content (%)</td>
<td>California Test 367</td>
<td>4 ± 2</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td>California Test 205</td>
<td>90</td>
</tr>
<tr>
<td>Coarse aggregate (% min)</td>
<td>75</td>
<td>--</td>
</tr>
<tr>
<td>One fractured face</td>
<td>Two fractured faces</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (% min)</td>
<td>California Test 234</td>
<td>45</td>
</tr>
<tr>
<td>(Passing no. 4 sieve and retained on no. 8 sieve.)</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>One fractured face</td>
<td>Los Angeles Rattler (% max)</td>
<td>California Test 211</td>
</tr>
<tr>
<td>Loss at 100 rev.</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td>Fine aggregate angularity (% min)</td>
<td>California Test 234</td>
</tr>
<tr>
<td>Flat and elongated particles (% by weight @ 5:1)</td>
<td>California Test 235</td>
<td>Report only</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)&lt;sup&gt;1&lt;/sup&gt;</td>
<td>LP-3</td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td>76.0–80.0</td>
<td></td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td>73.0–76.0</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td>65.0–75.0</td>
<td>65.0–75.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td>65.0–75.0</td>
<td></td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)&lt;sup&gt;3&lt;/sup&gt;</td>
<td>LP-2</td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td>17.0</td>
<td>17.0</td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td>15.0</td>
<td>15.0</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td>14.0</td>
<td>14.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td>13.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Dust proportion&lt;sup&gt;4&lt;/sup&gt;</td>
<td>LP-4</td>
<td></td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings</td>
<td>0.9–2.0</td>
<td>0.9–2.0</td>
</tr>
<tr>
<td>1/2&quot; and 3/4&quot; gradings</td>
<td>0.6–1.3</td>
<td>0.6–1.3</td>
</tr>
<tr>
<td>Smoothness</td>
<td>Section 39-1.12</td>
<td>12-foot straight-edge, must grind, and PI₀</td>
</tr>
<tr>
<td>Asphalt binder</td>
<td>Various</td>
<td>Section 92</td>
</tr>
<tr>
<td>Asphalt rubber binder</td>
<td>Various</td>
<td>--</td>
</tr>
<tr>
<td>Asphalt modifier</td>
<td>Various</td>
<td>--</td>
</tr>
<tr>
<td>CRM</td>
<td>Various</td>
<td>--</td>
</tr>
</tbody>
</table>

<sup>a</sup> The Engineer determines combined aggregate gradations containing RAP under Laboratory Procedure LP-9.<br><sup>b</sup> "X" denotes the sieves the Engineer tests for the specified aggregate gradation.<br><sup>c</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.<br><sup>d</sup> The Engineer reports the average of 3 tests from a single split sample.<br><sup>e</sup> The Engineer determines field compaction for any of the following conditions:<br>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.<br>2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.<br><sup>f</sup> California Test 375 is used to determine field compaction, except the Engineer uses:<br>1. California Test 375, Method A, to determine in-place density measurements instead of using the nuclear gauge specified in Part 4 of California Test 375.<br>2. California Test 309 is used to determine the maximum theoretical density instead of determining maximum density as specified in Part 5 of California Test 375.<br><sup>g</sup> Alter California Test 304, Part 2.B.2.c: "After compaction in the mechanical compactor, cool to 140 ±5 °F by allowing the briquettes to cool at room temperature for 0.5 hour, then place the briquettes in the oven at 140 °F from 2 to 3 hours."

<sup>h</sup> The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.<br><sup>i</sup> The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.<br><sup>j</sup> Report only if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from the OBC value submitted on a Contractor Hot Mix Asphalt Design Data form.<br><sup>k</sup> Voids in mineral aggregate for RHMA-G must be within this range.
Replace the 5th paragraph of section 39-2.03A with:

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:

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

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>HMA type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation&lt;sup&gt;a&lt;/sup&gt;</td>
<td>California Test 202</td>
<td>JMF ± tolerance&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Sand equivalent (min)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>California Test 217</td>
<td>47</td>
</tr>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td>JMF ± 0.45</td>
</tr>
<tr>
<td>HMA moisture content (% max)</td>
<td>California Test 226 or 370</td>
<td>1.0</td>
</tr>
<tr>
<td>Stabilometer value (min)&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>California Test 366</td>
<td>30</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Two fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (% min)&lt;sup&gt;f&lt;/sup&gt;</td>
<td>California Test 205</td>
<td>90</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>Los Angeles Rattler (% max)</td>
<td>California Test 211</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 rev.</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air void content (%)&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>California Test 367</td>
<td>4 ± 2</td>
</tr>
<tr>
<td>Fine aggregate angularity (% max)&lt;sup&gt;f&lt;/sup&gt;</td>
<td>California Test 234</td>
<td>45</td>
</tr>
<tr>
<td>Flat and elongated particles (% max by weight @ 5:1)</td>
<td>California Test 235</td>
<td>Report only</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>76.0–80.0</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8” grading</td>
<td></td>
<td>73.0–76.0</td>
</tr>
<tr>
<td>1/2” grading</td>
<td></td>
<td>65.0–75.0</td>
</tr>
<tr>
<td>3/4” grading</td>
<td></td>
<td>65.0–75.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voids in mineral aggregate (% min)</th>
<th>LP-2</th>
<th>17.0</th>
<th>17.0</th>
<th>--</th>
<th>--</th>
</tr>
</thead>
<tbody>
<tr>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td>15.0</td>
<td>15.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3/8” grading</td>
<td></td>
<td>14.0</td>
<td>14.0</td>
<td>18.0–23.0</td>
<td>18.0–23.0</td>
</tr>
<tr>
<td>1/2” grading</td>
<td></td>
<td>13.0</td>
<td>13.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3/4” grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dust proportion</th>
<th>LP-4</th>
<th>0.9–2.0</th>
<th>0.9–2.0</th>
<th>Report only</th>
<th>--</th>
</tr>
</thead>
<tbody>
<tr>
<td>(%)</td>
<td></td>
<td>0.6–1.3</td>
<td>0.6–1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 and 3/8” gradings</td>
<td>Section 39-1.12</td>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
</tr>
<tr>
<td>1/2” and 3/4” gradings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoothness</th>
<th>Various</th>
<th>Section 92</th>
<th>Section 92</th>
<th>Section 92</th>
<th>Section 92</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asphalt binder</th>
<th>Various</th>
<th>Section 92</th>
<th>Section 92</th>
<th>Section 92</th>
<th>Section 92</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td>12-foot straight-edge and must-grind</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asphalt rubber binder</th>
<th>Various</th>
<th>--</th>
<th>--</th>
<th>Section 92-1.01D(2) and section 39-1.02D</th>
<th>Section 92-1.01D(2) and section 39-1.02D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Section 39-1.02D</td>
<td>Section 39-1.02D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asphalt modifier</th>
<th>Various</th>
<th>--</th>
<th>--</th>
<th>Section 39-1.02D</th>
<th>Section 39-1.02D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CRM</th>
<th>Various</th>
<th>--</th>
<th>--</th>
<th>Section 39-1.02D</th>
<th>Section 39-1.02D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

285 degrees F

---

\[ \text{Replace "280 degrees F" in item 2 in the 6th paragraph of section 39-3.04 with: 01-20-12} \]
Replace the 8th paragraph of section 39-4.02C with:

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

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum sampling and testing frequency</th>
<th>HMA Type</th>
<th>Location of sampling</th>
<th>Maximum reporting time allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradationa</td>
<td>California Test 202</td>
<td>1 per 750 tons</td>
<td>JMF ± toleranceb</td>
<td>JMF ± toleranceb</td>
<td>JMF ± toleranceb</td>
</tr>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td>1 per 750 tons</td>
<td>JMF ±0.45</td>
<td>JMF ±0.45</td>
<td>JMF ±0.50</td>
</tr>
<tr>
<td>Field compaction (% max. theoretical density)c,d</td>
<td>QC plan</td>
<td>92–96</td>
<td>92–96</td>
<td>91–96</td>
<td>QC plan</td>
</tr>
<tr>
<td>Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants e</td>
<td>California Test 226 or 370</td>
<td>2 per day during production</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Sand equivalent (min) f</td>
<td>California Test 217</td>
<td>1 per 750 tons</td>
<td>47</td>
<td>42</td>
<td>47</td>
</tr>
<tr>
<td>HMA moisture content (% max)</td>
<td>California Test 226 or 370</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Stabilometer value (min)f,g</td>
<td>California Test 366</td>
<td>1 per 4,000 tons or 2 per 5 business days, whichever is greater</td>
<td>30</td>
<td>30</td>
<td>--</td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings 1/2&quot; and 3/4&quot; gradings</td>
<td>California Test 366</td>
<td>37</td>
<td>35</td>
<td>23</td>
<td>California Test 125</td>
</tr>
<tr>
<td>Air void content (% f,h</td>
<td>California Test 367</td>
<td>4 ± 2</td>
<td>4 ± 2</td>
<td>TV ± 2</td>
<td></td>
</tr>
</tbody>
</table>

01-20-12
<table>
<thead>
<tr>
<th>Percent of crushed particles coarse aggregate (% min.):</th>
<th>California Test 205</th>
<th>90</th>
<th>25</th>
<th>--</th>
<th>California Test 211</th>
</tr>
</thead>
<tbody>
<tr>
<td>One fractured face</td>
<td></td>
<td>75</td>
<td>--</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Two fractured faces</td>
<td></td>
<td>70</td>
<td>20</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.):</td>
<td></td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>California Test 211</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (% max):</td>
<td>California Test 211</td>
<td>12</td>
<td>--</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Loss at 100 rev.</td>
<td></td>
<td>45</td>
<td>50</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td></td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate angularity (% min)</td>
<td>California Test 234</td>
<td>Report only</td>
<td>Report only</td>
<td>Report only</td>
<td>California Test 211</td>
</tr>
<tr>
<td>Flat and elongated particle (% max by weight @ 5:1)</td>
<td>California Test 235</td>
<td>Report only</td>
<td>Report only</td>
<td>Report only</td>
<td>California Test 211</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>76.0–80.0</td>
<td>76.0–80.0</td>
<td>Report only</td>
<td>LP-3</td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td>73.0–76.0</td>
<td>73.0–76.0</td>
<td>Report only</td>
<td>LP-3</td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td></td>
<td>65.0–75.0</td>
<td>65.0–75.0</td>
<td>Report only</td>
<td>LP-3</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>65.0–75.0</td>
<td>65.0–75.0</td>
<td>Report only</td>
<td>LP-3</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td>65.0–75.0</td>
<td>65.0–75.0</td>
<td>Report only</td>
<td>LP-3</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min.)</td>
<td>LP-2</td>
<td>17.0</td>
<td>17.0</td>
<td>--</td>
<td>LP-2</td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td>15.0</td>
<td>15.0</td>
<td>--</td>
<td>LP-2</td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td></td>
<td>14.0</td>
<td>14.0</td>
<td>18.0–23.0</td>
<td>LP-2</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>13.0</td>
<td>13.0</td>
<td>18.0–23.0</td>
<td>LP-2</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td>13.0</td>
<td>13.0</td>
<td>18.0–23.0</td>
<td>LP-2</td>
</tr>
<tr>
<td>Dust proportion:&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LP-4</td>
<td>0.9–2.0</td>
<td>0.9–2.0</td>
<td>Report only</td>
<td>LP-4</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>--------</td>
<td>--------</td>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>No. 4 and 3/8” gradings</td>
<td>1/2” and 3/4” gradings</td>
<td>0.6–1.3</td>
<td>0.6–1.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Smoothness | Section 39-1.12 | 12-foot straight-edge, must-grind, and \( P_{I0} \) | 12-foot straight-edge, must-grind, and \( P_{I0} \) | 12-foot straight-edge, must-grind, and \( P_{I0} \) | -- |

| Asphalt rubber binder viscosity \( @ 375 \) °F, centipoises | Section 39-1.02D | -- | -- | -- | 1,500–4,000 | Section 39-1.02D | 24 hours |

| CRM | Section 39-1.02D | -- | -- | -- | Section 39-1.02D | Section 39-1.02D | 48 hours |

---

<sup>a</sup> Determine combined aggregate gradation containing RAP under Laboratory Procedure LP-9.

<sup>b</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.

<sup>c</sup> Determines field compaction for any of the following conditions:

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

<sup>d</sup> California Test 375 is used to determine field compaction, except use:

1. In-place density measurements using the method specified in your QC plan instead of using the nuclear gauge specified in Part 4 of California Test 375
2. California Test 309 to determine the maximum theoretical density instead of determining maximum density as specified in Part 5 of California Test 375

<sup>e</sup> For adjusting the plant controller at the HMA plant.

<sup>f</sup> Report the average of 3 tests from a single split sample.

<sup>g</sup> Alter California Test 304, Part 2.B.2.c: "After compaction in the mechanical compactor, cool to 140 ± 5 °F by allowing the briquettes to cool at room temperature for 0.5 hour, then place the briquettes in the oven at 140 °F from 2 to 3 hours."

<sup>h</sup> Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

<sup>i</sup> The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

<sup>j</sup> Report only if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from the OBC value submitted on a Contractor Hot Mix Asphalt Design Data form.

<sup>k</sup> 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:**

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:**

or
Replace the 1st paragraph of section 39-4.04A with:

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

<table>
<thead>
<tr>
<th>Index (i)</th>
<th>Quality characteristic</th>
<th>Weighting factor (w)</th>
<th>Test method</th>
<th>HMA type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aggregate gradation a</td>
<td></td>
<td></td>
<td>A B RHMA-G</td>
</tr>
<tr>
<td>1</td>
<td>1/2&quot;</td>
<td>X b</td>
<td>California Test 202</td>
<td>JMF ± Tolerance c</td>
</tr>
<tr>
<td>1</td>
<td>3/8&quot;</td>
<td>--</td>
<td>X</td>
<td>0.05</td>
</tr>
<tr>
<td>1</td>
<td>No. 4</td>
<td>--</td>
<td>X</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>No. 8</td>
<td>X</td>
<td>X</td>
<td>0.10</td>
</tr>
<tr>
<td>3</td>
<td>No. 200</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Asphalt binder content (%)</td>
<td>0.30</td>
<td>California Test 379 or 382</td>
<td>JMF ± 0.45</td>
</tr>
<tr>
<td>5</td>
<td>Field compaction (% max. theoretical density) d, e</td>
<td>0.40</td>
<td>California Test 375</td>
<td>92–96</td>
</tr>
<tr>
<td>5</td>
<td>Sand equivalent (min) f</td>
<td>California Test 217</td>
<td>47</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Stabilometer value (min) f,g</td>
<td>No. 4 and 3/8&quot; gradings 1/2&quot; and 3/4&quot; gradings</td>
<td>California Test 366</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Air void content (%) h</td>
<td>California Test 367</td>
<td>4 ± 2</td>
<td>4 ± 2</td>
</tr>
<tr>
<td></td>
<td>Percent of crushed particles coarse aggregate (% min)</td>
<td>California Test 205</td>
<td>90</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>One fractured face</td>
<td></td>
<td>75</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Two fractured faces</td>
<td></td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Fine aggregate (% min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Passing no. 4 sieve and retained on No. 8 sieve.) One fractured face</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HMA moisture content (%, max)</td>
<td>California Test 226 or 370</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Los Angeles Rattler (% max) Loss at 100 rev.</td>
<td>California Test 211</td>
<td>12</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Loss at 500 rev.</td>
<td></td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Fine aggregate angularity (% min) i</td>
<td>California Test 234</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Flat and elongated particle (% max by weight @ 5:1)</td>
<td>California Test 235</td>
<td>Report only</td>
<td>Report only</td>
<td>Report only</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)^1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot; grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids filled with asphalt (%)^1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 grading</td>
<td></td>
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<tr>
<td>3/8&quot; grading</td>
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<tr>
<td>1/2&quot; grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion^1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4 and 3/8&quot; gradings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot; and 3/4&quot; gradings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoothness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 39-1.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt binder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt rubber binder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt modifier</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Various</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^a The Engineer determines combined aggregate gradations containing RAP under Laboratory Procedure LP-9.
^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 California Test 375 is used to determine field compaction, except the Engineer uses:
1. California Test 308, Method A, to determine in-place density measurements instead of using the nuclear gauge specified in Part 4 of California Test 375
2. California Test 309 to determine the maximum theoretical density instead of determining maximum density as specified in Part 5 of California Test 375
^f The Engineer reports the average of 3 tests from a single split sample.
^g Alter California Test 304, Part 2.B.2.c: "After compaction in the mechanical compactor, cool to 140 ± 5 °F by allowing the briquettes to cool at room temperature for 0.5 hour, then place the briquettes in the oven at 140 °F from 2 to 3 hours."
^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.
Replace the 3rd paragraph of section 39-4.04A with:

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.

40 CONCRETE PAVEMENT

Replace section 40-1.01C(4) with:

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:

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).

Replace the 2nd and 3rd paragraphs in section 40-1.01D(4) with:

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:**

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:**

Use a California profilograph to determine the concrete pavement profile.

**Replace the title of the table in section 40-1.01D(13)(a) with:**

Concrete Pavement Acceptance Testing

**Replace the 2nd and 3rd paragraphs in section 40-1.01D(13)(a) with:**

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 the 4th item of the list in the 2nd paragraph in section 40-1.01D(13)(c)(2).**

**Replace the 1st and 2nd items in the list in the 2nd paragraph in 40-1.01D(13)(d) with:**

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:**

$n_c$ = 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:

The authorized laboratory

Replace the 2nd item in the 2nd paragraph of section 40-1.01D(13)(g):

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:

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:

PCC for concrete pavement must comply with section 90-1 except as otherwise specified.

Replace the paragraphs in section 40-1.02D with:

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:

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:

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:

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:

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:

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:

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:

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 S\textsubscript{04}
3. Impurities that cause pavement discoloration or surface etching

Replace the paragraph in section 40-1.03B with:

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:

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:

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:

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:

Place tie bars in compliance with the tolerances shown in the following table:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal and vertical skew</td>
<td>10 degrees maximum</td>
</tr>
<tr>
<td>Longitudinal translation</td>
<td>± 2 inch maximum</td>
</tr>
<tr>
<td>Horizontal offset (embedment)</td>
<td>± 2 inch maximum</td>
</tr>
<tr>
<td>Vertical depth</td>
<td>1. Not less than 1/2 inch below the saw cut depth of joints</td>
</tr>
<tr>
<td></td>
<td>2. When measured at any point along the bar, not less than 2 inches clear of the pavement's surface and bottom</td>
</tr>
</tbody>
</table>

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Replace item 4 in the 2nd paragraph in section 40-1.03I with:

4. Use tie bar baskets. Anchor baskets at least 200 feet in advance of pavement placement activity. If you request a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before paving, demonstrate the tie bars do not move from their specified depth and alignment during paving. Use fasteners to anchor tie bar baskets.

Replace "The maximum distance below the depth shown must be 0.05 foot." in the table in section 40-1.03J with:

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

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:

1. Use self-propelled machine floats.
2. Determine the number of machine floats required to perform the work at a rate equal to the pavement delivery rate. If the time from paving to machine float finishing exceeds 30 minutes, stop pavement delivery. When machine floats are in proper position, you may resume pavement delivery and paving.
3. Run machine floats on side forms or adjacent pavement lanes. If running on adjacent pavement, protect the adjacent pavement surface under section 40-1.03P. Floats must be hardwood, steel, or steel-shod wood. Floats must be equipped with devices that adjust the underside to a true flat surface.

If using the hand method, finish pavement smooth and true to grade with manually operated floats or powered finishing machines.
40-1.03L(2)(c) Slip-Form Finishing

If slip-form construction is used, the slip-form paver must give the pavement a preliminary finish. You may supplement the slip-form paver with machine floats.

Before the pavement hardens, correct pavement edge slump in excess of 0.02 foot exclusive of edge rounding.

40-1.03L(3) Final Finishing

After completing preliminary finishing, round the edges of the initial paving widths to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius.

Before curing, texture the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with a steel-tined device that produces grooves parallel with the centerline.

Construct longitudinal grooves with a self-propelled machine designed specifically for grooving and texturing pavement. The machine must have tracks to maintain constant speed, provide traction, and maintain accurate tracking along the pavement surface. The machine must have a single row of rectangular spring steel tines. The tines must be from 3/32 to 1/8 inch wide, on 3/4-inch centers, and must have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep. The machine must have horizontal and vertical controls. The machine must apply constant down pressure on the pavement surface during texturing. The machines must not cause ravels.

Construct grooves over the entire pavement width in a single pass except do not construct grooves 3 inches from the pavement edges and longitudinal joints. Final texture must be uniform and smooth. Use a guide to properly align the grooves. Grooves must be parallel and aligned to the pavement edge across the pavement width. Grooves must be from 1/8 to 3/16 inch deep after the pavement has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand-construct grooves under section 40-1.03L(2) using the hand method. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Initial and final texturing must produce a coefficient of friction of at least 0.30 when tested under California Test 342. Notify the Engineer when the pavement is scheduled to be opened to traffic to allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is ready for testing which is the latter of:

1. Seven days after paving
2. When the pavement has attained a modulus of rupture of 550 psi

The Department tests for coefficient of friction within 7 days of receiving notification that the pavement is ready for testing.

Do not open the pavement to traffic unless the coefficient of friction is at least 0.30.

40-1.03M Reserved

Replace the 4th paragraph of 40-1.03P with:

Construct crossings for traffic convenience. If authorized, you may use RSC for crossings. Do not open crossings until the Department determines that the pavement's modulus of rupture is at least 550 psi under California Test 523 or California Test 524.
Replace the 1st paragraph of section 40-6.01A with:

Section 40-6 includes specifications for applying a high molecular weight methacrylate resin system to pavement surface cracks that do not extend the full slab depth.

Replace the 4th paragraph of section 40-6.01C(2) with:

If the project is in an urban area adjacent to a school or residence, the public safety plan must also include an airborne emissions monitoring plan prepared by a CIH certified in comprehensive practice by the American Board of Industrial Hygiene. Submit a copy of the CIH's certification. The CIH must monitor the emissions at a minimum of 4 points including the mixing point, the application point, and the point of nearest public contact. At work completion, submit a report by the industrial hygienist with results of the airborne emissions monitoring plan.

Delete the 1st sentence of the 2nd paragraph in section 40-6.02B.

Replace the 4th item in the last paragraph in section 40-6.03A with:

4. Coefficient of friction is at least 0.30 under California Test 342

Replace the paragraph in section 40-6.04 with:

Not Used

Add to section 40:

40-7–40-15 RESERVED

DIVISION VI STRUCTURES

47 EARTH RETAINING SYSTEMS

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.
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

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:

1. You must designate a review sequence for submittals
2. Review time for any submittal is the review time specified plus 15 days for each submittal of higher priority still under review

09-16-11

49 PILING

01-20-12

Replace the 2nd paragraph of section 49-2.01D with:

Furnish piling is measured along the longest side of the pile from the specified tip elevation shown to the plane of pile cutoff.

01-20-12

Add to section 49-3.01A:

Concrete must comply with section 51.

01-20-12

Replace the 1st paragraph of section 49-3.01C with:

Except for CIDH concrete piles constructed under slurry, construct CIP concrete piles such that the excavation methods and the concrete placement procedures provide for placing the concrete against undisturbed material in a dry or dewatered hole.

01-20-12
Replace "Reserved" in section 49-3.02A(2) with:

01-20-12
dry hole:
1. Except for CIDH concrete piles specified as end bearing, a drilled hole that:
   1.1. Accumulates no more than 12 inches of water in the bottom of the drilled hole during a period of 1 hour without any pumping from the hole during the hour.
   1.2. Has no more than 3 inches of water in the bottom of the drilled hole immediately before placing concrete.
2. For CIDH concrete piles specified as end bearing, a drilled hole free of water without the use of pumps.

Replace "Reserved" in section 49-3.02A(3)(a) with:

01-20-12
If plastic spacers are proposed for use, submit the manufacturer's data and a sample of the plastic spacer. Allow 10 days for review.

Replace item 2 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 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.
50 PRESTRESSING CONCRETE

01-20-12

Add to section 50-1.02:

09-16-11

50-1.02G Sheathing

Sheathing for debonding prestressing strand must:

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

Split sheathing must overlap at least 3/8 inch.

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

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

Add to section 50-1.03B(1):

01-20-12

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

Add to section 50-1.03B(2):

09-16-11

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

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

Distribute the debonded strands symmetrically about the vertical centerline of the girder. The debonded lengths of pairs of strands must be equal.

Do not terminate debonding at any one cross section of the member for more than 40 percent of the debonded strands or 4 strands, whichever is greater.

Thoroughly seal the ends with waterproof tape to prevent the intrusion of water or cement paste before placing the concrete.
51 CONCRETE STRUCTURES

Add to section 51-1.03E(5):

Drill the holes without damaging the adjacent concrete. If reinforcement is encountered during drilling before the specified depth is attained, notify the Engineer. Unless coring through the reinforcement is authorized, drill a new hole adjacent to the rejected hole to the depth shown.

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

Except for components in contact with the tires, the design loading must be the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. Each component in contact with the tires must support a minimum of 80 percent of the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. The tire contact area must be 10 inches measured normal to the longitudinal assembly axis by 20 inches wide. The assembly must provide a smooth-riding joint without slapping of components or tire rumble.

52 REINFORCEMENT

Replace section 52-6.02D with:

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.
2. For "Necking (Option II)," the largest measured strain must be at least:
   2.1 Six percent for no. 11 and larger bars
   2.2 Nine percent for no. 10 and smaller bars
58  SOUND WALLS
08-05-11
Replace the 1st paragraph of section 58-2.01D(5)(a) with:

You must employ a special inspector and an authorized laboratory to perform Level 1 inspections and structural tests of masonry to verify the masonry construction complies with section 1704, "Special Inspections," and section 2105, "Quality Assurance," of the 2007 CBC.

DIVISION VII  DRAINAGE
70  MISCELLANEOUS DRAINAGE FACILITIES
01-20-12
Replace section 70-5.02A(2) with:

70-5.02A(2) Plastic Flared End Sections
Plastic flared end sections must comply with ASTM D 3350.

DIVISION VIII  MISCELLANEOUS CONSTRUCTION
72  SLOPE PROTECTION
01-20-12
Replace the row under "Class" in the table titled "Concreted-Rock Grading" in section 72-3.02B with:

<table>
<thead>
<tr>
<th>Light</th>
<th>Facing</th>
<th>Cobble</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 T</td>
<td>1/4 T</td>
<td></td>
</tr>
</tbody>
</table>

Replace the row under "Rock class" in the table titled "Minimum Concrete Penetration" in section 72-3.03E with:

<table>
<thead>
<tr>
<th>Light</th>
<th>Facing</th>
<th>Cobble</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 T</td>
<td>1/4 T</td>
<td></td>
</tr>
</tbody>
</table>
74 PUMPING EQUIPMENT AND CONTROLS
01-20-12
Replace the 1st sentence of the 1st paragraph in section 74-2.01D(2) with:

Drainage pumps must be factory certified under ANSI/HI 14.6.

DIVISION IX TRAFFIC CONTROL FACILITIES
83 RAILINGS AND BARRIERS
10-21-11
Add to section 83-2.02D(1):

For a concrete barrier transition:
1. Remove portions of the existing concrete barrier where shown under section 15-3
2. Roughen the contact surface of the existing concrete barrier
3. Drill and bond dowels into the existing concrete barrier under section 51-1

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS
01-20-12
Replace the 1st paragraph in section 84-2.04 with:

A double extruded thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 2 traffic stripes.
A double sprayable thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 1 traffic stripe.

Add to section 84:

84-6 THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS WITH ENHANCED WET NIGHT VISIBILITY

Reserved

84-7–84-10 RESERVED
86 ELECTRICAL SYSTEMS
01-20-12
Replace section 86-2.06 with:

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
able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

Frame must be anchored to the box with 1/4 by 2-1/4 inch concrete anchors. Four concrete anchors must be included for No. 3-1/2(T) pull box; one placed in each corner. Six concrete anchors must be included for No. 5(T) and No. 6(T) pull boxes; one placed in each corner and one near the middle of each of the longer sides.

Nuts must be zinc-plated carbon steel, vibration resistant, and have a wedge ramp at the root of the thread.

After installation of traffic pull box, install the steel cover and keep it bolted down when your activities are not in progress at the pull box. When the steel cover is placed for the final time, the cover and Z bar frame must be cleaned of debris and tightened securely.

Steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must not exceed more than 1/8 inch above the top of the cover.

Concrete placed around and under traffic pull boxes must be minor concrete.

---

### 88 GEOSYNTHETICS

01-20-12

Replace the row for hydraulic bursting strength in the table in the 2nd paragraph of section 88-1.02B with:

<table>
<thead>
<tr>
<th>Puncture strength, lb min</th>
<th>ASTM D 6241</th>
<th>600</th>
</tr>
</thead>
</table>

Replace the value for permittivity of woven fabric in the table in the 1st paragraph of section 88-1.02E with:

0.05

Replace the value for apparent size opening of nonwoven fabric in the table in the 1st paragraph of section 88-1.02E with:

0.012

Replace the table in the 1st paragraph of section 88-1.02G with:

| Sediment Filter Bag
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
<td>Test</td>
<td>Values</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Grab breaking load, lb, 1-inch grip</td>
<td>ASTM D 4632</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>
Replace the table in the 1st paragraph of section 88-1.02H with:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab breaking load, lb, 1-inch grip min, in each direction</td>
<td>ASTM D 4632</td>
<td>200 200</td>
</tr>
<tr>
<td>Apparent elongation, percent min, in each direction</td>
<td>ASTM D 4632</td>
<td>15 50</td>
</tr>
<tr>
<td>Water flow rate, gal per minute/sq ft min and max average roll value</td>
<td>ASTM D 4491</td>
<td>4-10 80-120</td>
</tr>
<tr>
<td>Permittivity, sec⁻¹ min</td>
<td>ASTM D 4491</td>
<td>0.05 1.0</td>
</tr>
<tr>
<td>Apparent opening size, inches max average roll value</td>
<td>ASTM D 4751</td>
<td>0.023 0.012</td>
</tr>
<tr>
<td>Ultraviolet resistance, % min retained grab breaking load, 500 hr.</td>
<td>ASTM D 4355</td>
<td>70 70</td>
</tr>
</tbody>
</table>

DIVISION X MATERIALS

90 CONCRETE

Replace the 3rd paragraph of section 90-1.01C(7) with:

Submit weighmaster certificates in printed form or, if authorized, in electronic media. Present electronic media in a tab-delimited format on a CD or DVD. Captured data for the ingredients represented by each batch must be line feed carriage return and one line separate record with sufficient fields for the specified data.
Replace the 3rd paragraph of section 90-3.01C(5) with:

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.

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

<table>
<thead>
<tr>
<th>Dynamic shear, Test temperature at 10 rad/s, °C</th>
<th>T 315</th>
<th>58</th>
<th>64</th>
<th>64</th>
<th>64</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>min G*/sin(delta), kPa</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>max G*/sin(delta), kPa</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>
5 MODIFICATIONS TO SPECIAL PROVISIONS

5.1 General

The following non-Standard Special Provisions (nSSP) listed in this Section 5 shall be used when the item specified is included in the work for this Project.

5.2 Draft nSSPs

The following nSSPs are in draft format and shall be edited by the Design-Builder according to the instructions in the hidden text included in the nSSP, and the guidelines given in the Department’s Ready-To-List Guide. Once edits are complete, the nSSP shall be submitted to the Department for review and approval.

Edits to these nSSPs within the limits of what is allowed by the hidden text instructions of the nSSP will require up to two weeks for each review by the Department. Edits beyond what is allowed by the hidden text instructions will require up to four weeks for each review.

The Design Builder shall bear the risk of schedule impacts associated with nSSP reviews. Once approved for use, each approved nSSP shall follow the same process as Standard Special Provisions (SSPs) for inclusion in RFC packages, except that written notice of approval shall accompany the nSSP.

1. Lean Concrete Base Rapid Setting
2. Hot Mix Asphalt Type A – Bond Breaker
3. Hot Mix Asphalt (Type C)
4. Jointed Plain Concrete Pavement (Rapid Strength Concrete)
5. Wireless Ethernet Radio (WER)
6. Modify Fiber Optic Communication System
7. Modify Communication System Transportation Management Center (TMC)
8. Closed Circuit Television Systems

5.3 Approved nSSPs

The following nSSPs are pre-approved for use on this project and shall be edited by the Design-Builder only according to the instruction in the hidden text included in the nSSP, and the guidelines given in the Department’s Ready-To-List Guide. These nSSPs shall follow the same process as Standard Special Provisions (SSPs) for inclusion in RFC packages.

9. Drainage Inlet Protection
10. Flared End Section Protection
11. Drainage Outlet Protection
12. Check Dam
1. Lean Concrete Base Rapid Setting

10-1. __LEAN CONCRETE BASE RAPID SETTING__

**GENERAL**

**Summary**

1. Lean concrete base rapid setting (LCBRS) must comply with Section 28, "Lean Concrete Base," of the Standard Specifications and these special provisions.

**Definitions**

*final set time:* Time a specific penetration resistance of 4,000 psi is achieved, determined under ASTM C 403.

*opening age:* Time the concrete achieves the specified strength for opening to traffic.

**Submittals**

**Mix Design**

3. Determine the mix proportions for LCBRS and submit mix designs.

4. At least 10 days before use, submit a mix design for LCBRS that includes:

1. Opening age
2. Proposed aggregate gradation
3. Proportions of hydraulic cement and aggregate
4. Types and amounts of chemical admixtures
5. Maximum time allowed between batching and placing
6. Range of ambient temperatures over which the mix design is effective
7. Final set time
8. Test result from California Test 548 testing, if required

5. Submit more than 1 mix design to plan for ambient temperature variations anticipated during LCBRS placement. Each mix design must have a maximum ambient temperature range of 18 °F.

6. **LCBRS Field Qualification**

Submit field qualification data and test reports including:
1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cubic yards
4. Type and source of ingredients used
5. Age and strength at time of cylinder testing

Field qualification test reports must be certified with a signature by an official in responsible charge of the laboratory performing the tests.

7
Submit strength development data for each mix design. You may use strength development data from laboratory-prepared samples. The testing ages for strength development data must include 1 hour before opening age, opening age, 1 hour after opening age, 24 hours, and 7 days.

8
Quality Control
Prepare compressive strength test specimens under California Test 540. Test compressive strength specimens under California Test 521 or ASTM C 1231. Perform at least 1 test at opening age for each 130 cubic yards placed. One test is two cylinders.

MATERIALS
Cement

9
Cement for LCBRS must comply with one of the following:

1. Cement for portland cement concrete specified in Section 90, "Portland Cement Concrete," of the Standard Specifications except Type III cement may be used.
2. A proprietary cementitious material in compliance with the specifications for cement in Section 90, "Portland Cement Concrete," of the Standard Specifications, except:

2.1. Cementitious material must meet the definition of hydraulic cement in ASTM C 219, and the following:

<table>
<thead>
<tr>
<th>Proprietary Cementitious Material</th>
<th>Test Description</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraction in Air</td>
<td>California Test 527, w/c ratio = 0.39±0.010</td>
<td>0.053%, max.</td>
<td></td>
</tr>
<tr>
<td>Mortar Expansion in Water</td>
<td>ASTM C 1038</td>
<td>0.04%, max.</td>
<td></td>
</tr>
<tr>
<td>Soluble Chloride*</td>
<td>California Test 422</td>
<td>0.05%, max.</td>
<td></td>
</tr>
<tr>
<td>Soluble Sulfate*</td>
<td>California Test 417</td>
<td>0.30%, max.</td>
<td></td>
</tr>
<tr>
<td>Thermal Stability</td>
<td>California Test 553</td>
<td>90%, min.</td>
<td></td>
</tr>
<tr>
<td>Compressive Strength @ 3 days</td>
<td>ASTM C 109</td>
<td>2500 psi</td>
<td></td>
</tr>
</tbody>
</table>

*Test is to be done on a cube specimen fabricated in conformance with the requirements in ASTM C 109, cured at least 14 days, and then pulverized so that 100% passes the No. 50 sieve.
2.2. Citric acid or borax may be used if requested in writing by the cement manufacturer and a sample is submitted to the Engineer. Chemical admixtures, if used, must be included when testing for requirements listed in the table above.

Aggregates

10
Aggregate for LCBRS must comply with either of the following:

2. Section 28-1.02, "Materials," of the Standard Specifications and the following:

2.1. The fifth paragraph of Section 28-1.02 does not apply
2.2. Perform California Test 548 except part H.

11

Field Qualification

Proposed mix proportions must be field qualified before you place concrete pavement. Use an American Concrete Institute (ACI) certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations.

The Engineer accepts field qualification if five cylinders, for each age, made under California Test 540 and tested under California Test 521 or under ASTM C 1231 comply with the following:

1. At a minimum, cylinders are tested at opening age, and 7 days of age
2. At opening age no single cylinder is less than 180 psi and the average strength is at least 200 psi
3. At 7 days age no single cylinder is less than 600 psi and the average strength is at least 725 psi

CONSTRUCTION

General

12
LCBRS must have a compressive strength of 200 psi at opening age of and 725 psi at 7 days age. LCBRS must have a compressive strength of 450 psi before placing HMA, base, or operating equipment on it. Concrete paving activities may commence after final set time of LCBRS. The pavement may be opened to traffic after opening age of LCBRS.

Proportioning

13
Weighing, measuring, and metering devices used for proportioning materials must comply with Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.
14

For central batch plants, indicators for weighing and measuring systems such as over and under dials must be grouped so that each indicator's smallest increment can be accurately read from the control point of the proportioning operation. In addition, indicators for weighing and measuring cement batched from a remote weighing system must be placed so that each indicator can be accurately read from the control point of the proportioning operation.

15

Weighing equipment must be insulated from other equipment's vibration or movement. When the plant is operating, each draft's material weight must not vary from the designated weight by more than the specified tolerances. Each scale graduation must be 0.001 of the usable scale capacity.

16

Aggregate must be weighed cumulatively. Equipment for weighing aggregate must have a zero tolerance of ±0.5 percent of the aggregate's designated total batch weight. Equipment for the separate weighing of the cement must have a zero tolerance of ±0.5 percent of the cement's designated individual batch draft. Equipment for measuring water must have a zero tolerance of ±0.5 percent of the water's designated weight or volume.

17

The weight indicated for any individual batch of material must not vary from the preselected scale setting by more than:

<table>
<thead>
<tr>
<th>Material</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>±1.0 percent of designated batch weight</td>
</tr>
<tr>
<td>Cement</td>
<td>±0.5 percent of designated batch weight</td>
</tr>
<tr>
<td>Water</td>
<td>±1.5 percent of designated batch weight or volume</td>
</tr>
</tbody>
</table>

18

If you choose aggregate that complies with Section 90-2.02, "Aggregates," and 90-3, "Aggregate Gradings," of the Standard Specifications, proportioning consists of dividing the aggregate into the specified sizes and storing them in separate bins, and then combining the aggregate with cement and water. Control the aggregate discharged from several bins with gates or mechanical conveyors. The means of discharge from the bins and from the weigh hopper must be interlocked so that no more than 1 bin can discharge at a time, and the weigh hopper cannot be discharged until the required quantity from each of the bins has been deposited in the weigh hopper.

19

Proportion dry ingredients by weight. Proportion liquid ingredients by weight or volume.

20

21

At the time of batching, dry and drain aggregates to a stable moisture content. Do not proportion aggregates with visible separation of water from the aggregate during proportioning. At the time of batching, the free moisture content of fine aggregate must not exceed 8 percent of its saturated, surface-dry weight.

22

If the proportioning plant has separate supplies of the same size group of aggregate with different moisture content, specific gravity, or surface characteristics affecting workability, exhaust 1 supply before using another supply.

23

Keep cement separated from the aggregate until discharged into the mixer. When discharged into the mixer, cement must be free of lumps and clods. Before reuse, clean fabric containers used for transportation or proportioning of cement.

24

Weigh systems for proportioning aggregate and cement must be individual and distinct from other weigh systems. Each weigh system must have a hopper, a lever system, and an indicator.

25. Delete Item 4 if Paras 29 through 57 are deleted (volumeric proportioning).

For batches with a volume of 1 cubic yard or more, proportioning must comply with one of the following methods:

1. Batch the ingredients at a central batch plant and charge them into a mixer truck for transportation to the pour site. Proportion ingredients under Section 90-5, "Proportioning," of the Standard Specifications.
2. Batch the ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a cement silo and weigh system, which must proportion cement for charging into the mixer truck.
3. Batch ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a location where pre-weighed containerized cement is added to the mixer truck. The cement pre-weighing operation must utilize a platform scale. The platform scale must have a maximum capacity of 2.75 tons with a maximum graduation size of 1 pound. Pre-weigh cement into a fabric container. The minimum amount of cement to be proportioned into any single container must be 1/2 of the total amount required for the load of LCBRS being produced.
4. Cement, water, and aggregate are proportioned volumetrically.

26

When ordered by the Engineer, determine the gross weight and tare weight of truck mixers on scales designated by the Engineer.

27

Install and maintain in operating condition an electrically actuated moisture meter. The meter must indicate on a readily visible scale the changes in the fine aggregate moisture content as it is batched. The meter must have a sensitivity of 0.5 percent by weight of the fine aggregate.
28
Obtain the Engineer's acceptance before mixing water into the concrete during hauling or after arrival at the delivery point. If the Engineer accepts additional water be incorporated into the concrete, the drum must revolve not less than 30 revolutions at mixing speed after the water is added and before starting discharge. Measure water added to the truck mixer at the job site through a meter in compliance with Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Paras 29 through 57: Delete when "Volumetric Proportioning" is not an option on the project. Discuss with District or Headquarters Weights and Measures Coordinator and METS, Rigid Pavement & Structural Concrete Unit. If volumetric proportioning is allowed only for a portion of the work, edit paragraph 25 to identify those locations. For example, for project where LCBRS is used for both new pavement and slab replacement, paragraph 25 could be edited to say "You may choose to proportion LCBRS by volume when placing underneath individual slab replacements."

Volumetric Proportioning

29
You may choose to proportion LCBRS by volume.

30

31
Batch-mixer trucks must proportion cement, water, aggregate, and additives by volume. Aggregate feeders must be connected directly to the drive on the cement vane feeder. The cement feed rate must be tied directly to the feed rate for the aggregate and other ingredients. Only change the ratio of cement to aggregate by changing the gate opening for the aggregate feed. The drive shaft of the aggregate feeder must have a revolution counter reading to the nearest full or partial revolution of the aggregate delivery belt.

32
Proportion aggregate with a belt feeder operated with an adjustable cutoff gate delineated to the nearest quarter increment. The gate opening height must be readily determinable. Proportion cement by any method that complies with the accuracy tolerance specifications. Proportion water with a meter under Section 9-1.01, "Measurement and Payment," of the Standard Specifications.

33
Calibrate the cutoff gate for each batch-mixer truck used and for each aggregate source. Calibrate batch-mixer trucks at 3 different aggregate gate settings that are commensurate with production needs. Perform at least 2 calibration runs for each aggregate gate.
Individual aggregate delivery rate check-runs must not deviate more than 1.0 percent from the mathematical average of all runs for the same gate and aggregate type. Each test run must be at least 1,000 pounds.

At the time of batching, dry and drain aggregates to a stable moisture content. Do not proportion aggregates with visible separation of water from the aggregate during proportioning. At the time of batching, the free moisture content of fine aggregate must not exceed 8 percent of its saturated, surface-dry weight.

If the proportioning plant has separate supplies of the same size group of aggregate with different moisture content, specific gravity, or surface characteristics affecting workability, exhaust 1 supply before using another supply.

Cover rotating and reciprocating equipment on batch-mixer trucks with metal guards.

Individual cement delivery rate check-runs must not deviate more than 1.0 percent of the mathematical average of 3 runs of at least 1,000 pounds each.

When the water meter operates from 50 to 100 percent of production capacity, the indicated weight of water delivered must not differ from the actual weight delivered by more than 1.5 percent for each of 2 runs of 300 gallons. Calibrate the water meter under California Test 109. The water meter must be equipped with a resettable totalizer and display the operating rate.

Conduct calibration tests for aggregate, cement, and water proportioning devices with a platform scale located at the calibration site. Platform scales for weighing test-run calibration material must have a maximum capacity of 2.75 tons with maximum graduations of 1 pound. Error test the platform scale within 8 hours of calibrating the batch-mixer truck proportioning devices. Perform error-testing with test weights under California Test 109. Furnish a witness scale that is within 2 graduations of the test weight load. The witness scale must be available for use at the production site throughout the production period. Equipment needed for the calibration of proportioning systems must remain available at the production site throughout the production period.

The batch-mixer truck must be equipped so that accuracy checks can be made. Recalibrate proportioning devices every 30 days after production starts or when you change the source or type of any ingredient.

A spot calibration is calibration of the cement proportioning system only. Perform a 2-run spot calibration each time 55 tons of cement passes through the batch-mixer truck. If the spot calibration shows the cement proportioning system does not comply with the specifications, complete a full calibration of the cement proportioning system before you resume production.
43
Proportion liquid admixtures with a meter.

44
Locate cement storage immediately before the cement feeder. Equip the system with a
device that automatically shuts down power to the cement feeder and aggregate belt feeder when
the cement storage level is less than 20 percent of the total volume.

45
Submit aggregate moisture determinations, made under California Test 223, at least every 2
hours during proportioning and mixing operations. Record moisture determinations and submit
them at the end of each production shift.

46
Equip each aggregate bin with a device that automatically shuts down the power to the
cement feeder and the aggregate belt feeder when the aggregate discharge rate is less than 95
percent of the scheduled discharge rate.

47
Proportioning device indicators must be in working order before starting proportioning and
mixing operations and must be visible when standing near the batch-mixer truck.

48
Identifying numbers of batch-mixer trucks must be at least 3 inches in height, and be located
on the front and rear of the vehicles.

49
Mix volumetric proportioned LCBRS in a mechanically operated mixer. You may use auger-
type mixers. Operate mixers uniformly at the mixing speed recommended by the manufacturer.
Do not use mixers that have an accumulation of hard concrete or mortar.

50
Do not mix more material than will permit complete mixing. Reduce the volume of material
in the mixer if complete mixing is not achieved. Continue mixing until a homogeneous mixture
is produced at discharge. Do not add water to the LCBRS after discharge.

51
Do not use equipment with components made of aluminum or magnesium alloys that may
have contact with plastic concrete during mixing or transporting of LCBRS.

52
The Engineer determines uniformity of concrete mixtures by differences in penetration
measurements made under California Test 533. Differences in penetration are determined by
comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer
load. The differences must not exceed 5/8 inch. Submit samples of freshly mixed concrete.
Sampling facilities must be safe, accessible, clean, and produce a sample that is representative of
production. Sampling devices and sampling methods must comply with California Test 125.

53
Do not use ice to cool LCBRS directly. If ice is used to cool water used in the mix, it must
be melted before entering the mixer.
54
When proportioning and charging cement into the mixer, prevent variance of the required quantity by conditions such as wind or accumulation on equipment.

55
Each mixer must have metal plates that provide the following information:

1. Designed usage
2. Manufacturer's guaranteed mixed concrete volumetric capacity
3. Rotation speed

56
The device controlling the proportioning of cement, aggregate, and water must produce production data. The production data must be captured at 15-minute intervals throughout daily production. Each capture of production data represents production activity at that time and is not a summation of data. The amount of material represented by each production capture is the amount produced in the period from 7.5 minutes before to 7.5 minutes after the capture time. The daily production data must be submitted in electronic or printed media at the end of each production shift. The reported data must be in the order including data titles as follows:

1. Weight of cement per revolution count
2. Weight of each aggregate size per revolution count
3. Gate openings for each used aggregate size
4. Weight of water added to the concrete per revolution count
5. Moisture content of each used aggregate size
6. Individual volume of other admixtures per revolution count
7. Time of day
8. Day of week
9. Production start and stop times
10. Batch-mixer truck identification
11. Name of supplier
12. Specific type of concrete being produced
13. Source of the individual aggregate sizes
14. Source, brand, and type of cement
15. Source, brand and type of individual admixtures
16. Name and signature of operator

57
You may input production data by hand into a pre-printed form or it may be 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.
Placing Concrete

58
You may use metal or wood side forms. Wood side forms must not be less than 1-1/2 inches thick.

59
Side forms must remain in place until the LCBRS edge no longer requires the protection of forms.

60
After you deposit the LCBRS on the subgrade, consolidate it with high-frequency internal vibrators. Consolidate adjacent to forms and across the full placement width. Place LCBRS as nearly as possible to its final position. Do not use vibrators for extensive shifting of LCBRS.

61
Spread and shape LCBRS with powered finishing machines supplemented by hand finishing.

62
After you mix and place LCBRS, do not add water to the surface to facilitate finishing. Use surface finishing additives as recommended by the manufacturer of the cement after their use is approved by the Engineer.

Final Finishing

63. Use when lean concrete base rapid setting is used with Concrete Pavement or Individual Slab Replacement.
The finished surface of LCBRS must not be above the grade established by the Engineer, or more than 0.05-foot below the grade established by the Engineer.

PAYMENT

64
Lean concrete base rapid setting is measured and paid for by the cubic yard in the same manner specified for lean concrete base in Sections 28-1.09, "Measurement," and Section 28-1.10, "Payment," of the Standard Specifications.
2. HOT MIX ASPHALT TYPE A - BOND BREAKER

Use in District 8 projects only. This specification is for HMA Type A – Bond Breaker, which is 0.10-foot in thickness for use below PCCP. Obtain approval from the Division of Pavement Management for editing beyond the instructions of this District SSP.

Use with amended Section 39, "Hot Mix Asphalt." Edit in plain language.

Use the Quality Control / Quality Assurance (QC / QA) process on projects containing at least 10,000 tons of HMA Type A - Bond Breaker.

Use the Standard process on all projects that do not meet the criteria for Quality Control / Quality Assurance.


For projects using the Standard or Method process, the District Materials Engineer (DME) may recommend lime treatment of aggregates in the locations defined by the “Desert AC” Delegation Memo (June 1, 2001).

BEES item codes triggered by this SSP are:
- 39XXX Hot Mix Asphalt Type A - Bond Breaker
- 397005 Tack Coat

10-1. HOT MIX ASPHALT TYPE A - BOND BREAKER

GENERAL

Summary

1*. Fill in the construction process to be used. (i.e., Standard or Quality Control / Quality Assurance)

This work includes producing and placing hot mix asphalt Type A - Bond Breaker using the ________________ process.

2

HMA Type A - Bond Breaker must comply with the requirements for HMA Type A of Section 39, “Hot Mix Asphalt,” of the Standard Specifications.
Submittals

3. Use Paras 3 through 5 for QC / QA projects only.

Quality Control / Quality Assurance Projects
With the job mix formula (JMF) submittal, submit:

1. Mix design data for the HMA Type A prior to the 1.0 percent increase in asphalt binder including:
   1.1. California Test 204 plasticity index results
   2.1. California Test 371 tensile strength ratio results for untreated HMA Type A
   3.1. California Test 371 tensile strength ratio results for treated HMA Type A if untreated HMA Type A tensile strength ratio is below 70

Quality Control and Assurance

4. Use Paras 4 and 5 for QC / QA projects only. Delete the subsection heading if the paras are deleted.

Quality Control / Quality Assurance Projects
Determine the antistrip treatment requirement for HMA Type A – Bond Breaker as follows:

1. For the mix design of HMA Type A, 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 in compliance with:

<table>
<thead>
<tr>
<th>Antistrip Treatment</th>
<th>Lab Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasticity index from 4 to 10^a</td>
<td></td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
<td>LP-7</td>
</tr>
<tr>
<td>Plasticity index less than 4</td>
<td></td>
</tr>
<tr>
<td>Liquid</td>
<td>LP-5</td>
</tr>
<tr>
<td>Dry hydrated lime without marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
<td>LP-7</td>
</tr>
</tbody>
</table>

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

2. For the mix design of HMA Type A and prior to the 1.0 percent increase in asphalt binder, determine tensile strength ratio under California Test 371 on the untreated HMA Type A. If the tensile strength ratio is less than 70:
   2.1. Choose from the antistrip treatments specified based on plasticity index.
   2.2. Test treated HMA Type A under California Test 371.
   2.3. Treat to a minimum tensile strength ratio of 70.

3. Do not test HMA Type A – Bond Breaker under California Test 371.
5

The Department does not use California Test 371 test results for JMF verification and production to determine specification compliance for HMA Type A – Bond Breaker.

6

QUALITY CONTROL TESTING

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

<table>
<thead>
<tr>
<th>HMA Type A – Bond Breaker Minimum Quality Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Characteristic</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Aggregate gradation (a)</td>
</tr>
<tr>
<td>Sand equivalent (min.) (c, g)</td>
</tr>
<tr>
<td>Asphalt binder content</td>
</tr>
<tr>
<td>HMA moisture content (max.)</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (minimum) (d, e)</td>
</tr>
<tr>
<td>Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants</td>
</tr>
<tr>
<td>Percent of crushed particles coarse aggregate (% min.) (g)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (% max) (g)</td>
</tr>
</tbody>
</table>

Notes:
- Determine combined aggregate gradation containing RAP under Laboratory Procedure LP-9.
- The tolerances must comply with the allowable tolerances in Section 39-1.02E, "Aggregate."
- Report the average of 3 tests from a single split sample.
- Required if the total paved thickness is at least 0.15-foot.
- Determine maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.
- For adjusting the plant controller at the HMA plant.
- The point and method of sampling will be agreed upon before aggregate production begins.
- Perform this test before lime treatment.
Apply white pigmented curing compound to the finished surface of the HMA Type A (Bond Breaker) within 2 days of placing the portland cement concrete pavement. Pigmented curing compound must conform to the requirements of ASTM Designation C 309, Type 2, Class A. Curing compound must be applied in 2 separate applications to the area to be surfaced with portland cement concrete pavement. Apply curing compound at the rate of 1 gallon per 150 square feet.

ENGINEER'S ACCEPTANCE
The Engineer samples for acceptance testing, and tests for:

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation(^a)</td>
<td>CT 202</td>
<td>JMF ± Tolerance(^b)</td>
</tr>
<tr>
<td>Sand equivalent (min.)(^c)</td>
<td>CT 217</td>
<td>47</td>
</tr>
<tr>
<td>Asphalt binder content</td>
<td>CT 379 or 382</td>
<td>JMF ± 0.45%</td>
</tr>
<tr>
<td>HMA moisture content (max.)</td>
<td>CT 370</td>
<td>1.0%</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (minimum)(^d)(^e)</td>
<td>Quality control plan</td>
<td>96%</td>
</tr>
<tr>
<td>Percent of crushed particles coarse aggregate (% min.)(^f)</td>
<td>CT 205</td>
<td>90</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>Two fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (% min)(^f)</td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (% max.)(^f)</td>
<td>CT 211</td>
<td>45</td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
\(^a\) The Engineer determines combined aggregate gradation containing RAP under Laboratory Procedure LP-9.
\(^b\) The tolerances must comply with the allowable tolerances in Section 39-1.02E.
\(^c\) "Aggregate."
\(^d\) The Engineer reports the average of 3 tests from a single split sample.
\(^e\) Required if the total paved thickness is at least 0.15-foot.
\(^f\) The Engineer determines maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

MATERIALS

Asphalt Binder
The grade of asphalt binder mixed with aggregate for HMA Type A - Bond Breaker must be PG 64-16.
10 Aggregate
The aggregate for HMA Type A – Bond Breaker must comply with the 3/8-inch grading.

11 Asphalt Binder Content
Increase the amount of asphalt binder mixed with aggregate for HMA Type A - Bond Breaker by 1.0 percent by weight of the dry aggregate over the optimum binder content (OBC) determined for use in HMA Type A under California Test 367.

12 Job Mix Formula and HMA Type A – Bond Breaker Evaluation
Prior to the 1.0 percent increase in asphalt binder, HMA Type A used for HMA Type A - Bond Breaker must conform to the requirements of Hot Mix Asphalt Mix Design Requirements.

13 Verification is testing for compliance with the specifications for:
1. Aggregate quality
2. HMA quality specified in the table HMA Type A - Bond Breaker Acceptance except percent of maximum theoretical density

CONSTRUCTION

14 Tack Coat
Apply tack coat for the HMA Type A – Bond Breaker to the Lean Concrete Base at the same rate as HMA over existing PCC pavement per Section 39-1.09.

15. Use for Standard process only. Use to require lime treatment of aggregates when recommended by the District Materials Engineer in the locations defined by the “Desert AC” Delegation Memo (June 1, 2001).
Add SSP 39-400.

Antistrip Treatment
Treat aggregate with lime slurry under "Hot Mix Asphalt Aggregate Lime Treatment – Slurry Method” and use Lab Procedure LP-7 for the mix design.

PAYMENT

16 HMA Type A - Bond Breaker will be measured and paid for in the same manner specified for HMA in conformance with the requirements of Section 39-5, "Measurement and Payment," of the Standard Specifications.
Full compensation for the additional 1 percent of asphalt binder used in HMA Type A - Bond Breaker and for furnishing and applying white pigmented curing compound to the surface of the HMA Type A - Bond Breaker is included in the contract price paid per ton for HMA Type A - Bond Breaker as designated in the Engineer's Estimate and no separate payment will be made therefor.
3. HOT MIX ASPHALT (TYPE C)

Use in District 8 projects only. Obtain approval from the Division of Pavement Management for editing beyond the instructions of this District SSP.

Use with amended Section 39, "Hot Mix Asphalt." Edit in plain language.

Use for projects that require high stability hot mix asphalt (HMA Type C). Use with concurrence of the District Materials Engineer or the District Pavement Engineer.

HMA Type C is intended for use where rutting is a concern including intersections, ramps, climbing lanes, and weigh stations.

Use the following pavement thicknesses for each gradation size of HMA Type C:

<table>
<thead>
<tr>
<th>Grading</th>
<th>Specified Total Thickness Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 - inch</td>
<td>0.15 foot – 0.25 foot</td>
</tr>
<tr>
<td>3/4 - inch</td>
<td>0.25 foot and above</td>
</tr>
<tr>
<td>1 - inch</td>
<td>0.35 foot and above</td>
</tr>
</tbody>
</table>

Use the Quality Control / Quality Assurance (QC / QA) process on projects with at least 10,000 tons of HMA Type C.

Use the Method process on projects with less than 250 tons of HMA Type C per location.

Use the Standard process on projects that do not meet the criteria for QC / QA and Method processes.


For projects using the Standard or Method process, the District Materials Engineer (DME) may recommend lime treatment of aggregates in the locations defined by the “Desert AC” Delegation Memo (June 1, 2001).

BEES item codes possibly triggered by this SSP are:

390129   Hot Mix Asphalt (Type C)
390135   Hot Mix Asphalt (Leveling)
397005   Tack Coat
394060   Data Core
395000   Prime Coat

Use other HMA item codes required by the plans or other SSPs (e.g., RHMA, OGFC, dike, rumble strips, etc.)
10-1.__ HOT MIX ASPHALT (TYPE C)

GENERAL

Summary

1*. Fill in the type of construction process to be used (Standard or Quality Control / Quality Assurance).

This work includes producing and placing hot mix asphalt (HMA) Type C using the _____ process.

2

Comply with the specifications for HMA Type A under Section 39, "Hot Mix Asphalt," of the Standard Specifications.

Submittals

3. Use Paras 3 through 5 for QC / QA projects only.

Quality Control / Quality Assurance Projects

With the job mix formula (JMF) submittal, submit:

1. California Test 204 plasticity index results
2. California Test 371 tensile strength ratio results for untreated HMA
3. California Test 371 tensile strength ratio results for treated HMA if untreated HMA tensile strength ratio is below 70

4

At project start-up and once during production, submit samples split from your HMA production sample for California Test 371 to the Engineer and the Transportation Laboratory, Attention: Moisture Test.

5

With the JMF submittal, at project start-up, and each 5,000 tons, submit the California Test 371 test results for mix design and production to the Engineer and electronically to:

Moisture_Tests@dot.ca.gov

6. If there is no paving on the travelled way or if the length of the project is less than 1 mile, delete Paras 6 through 10.

Data Cores

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

7

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

1. A summary of data cores taken
2. A photograph of each data core
8
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 For recovered material, 1/2 inch
   7.2 For unstabilized material, 1.0 inch

8. Location including:
   8.1 County
   8.2 Route
   8.3 Post mile
   8.4 Lane number
   8.5 Lane direction
   8.6 Station

9
Each data core digital photograph must include a ruler laid next to the data core. Each photograph must include:

1. The 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

10
After data core summary and photograph submittal, dispose of cores under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.
11. Use Paras 11 through 14 for QC / QA projects only. Delete the subsection heading, "Quality Control / Quality Assurance Projects," if the paras are deleted.

Quality Control and Assurance

Quality Control / Quality Assurance Projects

For the mix design, 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 in compliance with:

<table>
<thead>
<tr>
<th>Antistrip Treatment</th>
<th>Lab Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasticity index from 4 to 10 (^a)</td>
<td></td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
<td>LP-7</td>
</tr>
<tr>
<td>Plasticity index less than 4</td>
<td></td>
</tr>
<tr>
<td>Liquid</td>
<td>LP-5</td>
</tr>
<tr>
<td>Dry hydrated lime without marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
<td>LP-6</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
<td>LP-7</td>
</tr>
</tbody>
</table>

Notes:

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

12

For the mix design, determine 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 plasticity index.
2. Test treated HMA under California Test 371.
3. Treat to a minimum tensile strength ratio of 70.

13

On the first production day and at least every 5,000 tons, sample HMA and test under California Test 371.

14

The Department does not use California Test 371 test results for JMF verification and production to determine specification compliance.

15. **Use if the Standard construction process is specified, otherwise delete.**

Take 3 density cores for every 250 tons of HMA Type C from random locations the Engineer designates.

16

With the minimum quality control testing for the specified construction process, perform sampling and testing at the specified frequency for the following quality characteristics:
### Minimum Quality Control

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Minimum Sampling and Testing Frequency</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>CT 379 or 382</td>
<td>1 per 750 tons and any remaining part</td>
<td>JMF ± 0.40</td>
</tr>
<tr>
<td>Stabilometer Value(^{a,b}) (min.)</td>
<td>CT 366</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more</td>
<td>37 (^{c}) (Modified) 35 (^{d})</td>
</tr>
<tr>
<td>Air voids content (%) (^{k,x})</td>
<td>CT 367</td>
<td>1 per 5,000 tons or 1 per 5 business days, whichever is more</td>
<td>90</td>
</tr>
<tr>
<td>Percent of crushed particles (^{l})</td>
<td>CT 205</td>
<td>1 per 5,000 tons or 1 per 5 business days, whichever is more</td>
<td>95</td>
</tr>
<tr>
<td>Coarse aggregate (% min.) Two fractured faces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve) (% min) One fractured face</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate angularity (^{e, f}) (% min.)</td>
<td>AASHTO T 304 Method A</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Los Angeles Rattler (^{i})</td>
<td>CT 211</td>
<td>As necessary and designated in the QCP. At least once per project</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 rev. (% max.) Loss at 500 rev. (% max.)</td>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Flat and elongated particles (^{l}) (% max. by weight @ 5:1)</td>
<td>ASTM D 4791</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Design air void content</td>
<td></td>
<td></td>
<td>4.0 – 5.0</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (%) (^{h,i,j})</td>
<td>CT 375</td>
<td>1 per 750 tons or any single location, whichever is less</td>
<td>92 – 97</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min.)</td>
<td>LP-2</td>
<td></td>
<td>14 – 15</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td>13 – 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td>12 – 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; grading</td>
<td>13 – 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 1&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 3/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more</td>
<td>65 – 60</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td>75 – 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td>65 – 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; grading</td>
<td>75 – 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion (^{l}) (P200/Pbe)</td>
<td>LP-4</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more (Report Only)</td>
<td>0.6 – 1.3</td>
</tr>
</tbody>
</table>

### Notes:

- \(^{a}\) Report the average of 3 tests from a single split sample.
- \(^{b}\) If the stability range is more than 12 points, prepare and test new briquettes.
- \(^{c}\) Follow CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb. leveling load; and perform stabilometer test at 140 °F.
- \(^{d}\) Modify CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi tamping pressure and 140 °F compaction temperature; apply 12,600 lb. leveling load; and perform stabilometer test at 140 °F.
e Determine the bulk specific gravity of each lab-compacted briquette under CT 308, Method A. Determine theoretical maximum specific gravity under CT 309. Calculate the air voids content of each specimen using CT 309 and LP 1. Modify CT 367, Paragraph C5, to use the design air voids content specified under "Hot Mix Asphalt Type C Mixture."

f Aggregate must comply with the quality specifications before it is treated with lime. During lime treatment except for dry lime on damp aggregate treatment at continuous mixing plants, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Prepare and test 3 samples from a single split sample for aggregate quality at the frequency specified during lime treatment and report test results as the average of the 3 tests.

g Void if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

h Required if the specified paved thickness is at least 0.15 foot.

i Determine maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

j For Standard process, take and average 3 cores per 250 tons of HMA placed.

k Minimum VMA dependent upon NMAS of JMF. NMAS is defined as one sieve size larger than the first sieve to retain more than 10 percent.

l Asphalt content based on dry weight of aggregate.

17

With the acceptance testing for the specified construction process, the Engineer samples and tests the following quality characteristics:

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>CT 379 or 382</td>
<td>JMF ± 0.40</td>
</tr>
<tr>
<td>Stabilometer Value a, b (min.)</td>
<td>CT 366</td>
<td>37 ( ^e ) (Modified) 35 ( ^d )</td>
</tr>
<tr>
<td>Air voids content (%) a, c</td>
<td>CT 367</td>
<td>Design ± 2</td>
</tr>
<tr>
<td>Percent of crushed particles ( ^f )</td>
<td>CT 205</td>
<td>95</td>
</tr>
<tr>
<td>Coarse aggregate (% min.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two fractured faces</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve) (% min)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Fine aggregate angularity ( ^l, g ) (% min.)</td>
<td>AASHTO T 304</td>
<td>45</td>
</tr>
<tr>
<td>Method A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler ( ^l )</td>
<td>CT 211</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 rev. (% max.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss at 500 rev. (% max.)</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Flat and elongated particles ( ^f )</td>
<td>ASTM D 4791</td>
<td>10</td>
</tr>
<tr>
<td>(% max. by weight @ 5:1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design air void content</td>
<td>4.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (%) h</td>
<td>CT 375</td>
<td>92 – 97</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min.)</td>
<td>LP-2</td>
<td>14</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>1&quot; grading ( ^g )</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>with NMAS = 1&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 3/4&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Voids filled with asphalt (%)

<table>
<thead>
<tr>
<th>Grading</th>
<th>LP-3</th>
<th>LP-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot; grading</td>
<td>65 -</td>
<td>60 - 70</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td>75</td>
<td>60 - 70</td>
</tr>
<tr>
<td>1&quot; grading</td>
<td>65 -</td>
<td>60 - 70</td>
</tr>
</tbody>
</table>

### Dust proportion \(^{(P200/Pbe)}\)

<table>
<thead>
<tr>
<th>LP-4</th>
<th>Report Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 – 1.3</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

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

b If the stability range is more than 12 points, the Engineer prepares and tests new briquettes.

c The Engineer follows CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb. leveling load; and perform stabilometer test at 140 °F.

d Modify CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi tamping pressure and 140 °F compaction temperature; apply 12,600 lb. leveling load; and perform stabilometer test at 140 °F.

e The Engineer determines the bulk specific gravity of each lab-compacted briquette under CT 308, Method A. The Engineer determines theoretical maximum specific gravity under CT 309. The Engineer calculates the air voids content of each specimen using CT 309 and LP 1. The Engineer modifies CT 367, Paragraph C5, to use the design air voids content specified under "Hot Mix Asphalt Type C Mixture."

f Aggregate must comply with the quality specifications before it is treated with lime. During lime treatment, except for dry lime on damp aggregate treatment at continuous mixing plants; the Engineer samples coarse and fine aggregate from individual stockpiles, combines aggregate in the JMF proportions, and prepares and tests 3 samples from a single split sample for aggregate quality at the frequency specified during lime treatment and report test results as the average of the 3 tests.

g Void if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

h Required if the specified paved thickness is at least 0.15 foot.

i Determine maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

j For Standard process, take and average 3 cores per 250 tons of HMA placed.

k Minimum VMA dependent upon NMAS of JMF. NMAS is defined as one sieve size larger than the first sieve to retain more than 10 percent.

l Asphalt content based on dry weight of aggregate.

---

**18**

The Engineer tests the 3 density cores you take from each 250 tons of HMA production. The Engineer determines the percent of maximum theoretical density for each density core by determining the density core's density and dividing by the maximum theoretical density. The Engineer determines the percent of maximum theoretical density for each 250 tons of HMA production by determining the average of the 3 density cores.

**19**

If the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot, 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.
20. Use if the Standard construction process is specified and air voids content is 4%. Delete para 21 if using this para.

For each 250 tons of HMA production, the Engineer determines a deduction for percent of maximum theoretical density for each average of 3 density cores if it is outside the specifications, as follows:

<table>
<thead>
<tr>
<th>HMA Type C Percent of Maximum Theoretical Density</th>
<th>Reduced Payment Factor</th>
<th>Reduced Payment Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.0</td>
<td>0.0000</td>
<td>97.0</td>
</tr>
<tr>
<td>91.9</td>
<td>0.0125</td>
<td>97.1</td>
</tr>
<tr>
<td>91.8</td>
<td>0.0250</td>
<td>97.2</td>
</tr>
<tr>
<td>91.7</td>
<td>0.0375</td>
<td>97.3</td>
</tr>
<tr>
<td>91.6</td>
<td>0.0500</td>
<td>97.4</td>
</tr>
<tr>
<td>91.5</td>
<td>0.0625</td>
<td>97.5</td>
</tr>
<tr>
<td>91.4</td>
<td>0.0750</td>
<td>97.6</td>
</tr>
<tr>
<td>91.3</td>
<td>0.0875</td>
<td>97.7</td>
</tr>
<tr>
<td>91.2</td>
<td>0.1000</td>
<td>97.8</td>
</tr>
<tr>
<td>91.1</td>
<td>0.1125</td>
<td>97.9</td>
</tr>
<tr>
<td>91.0</td>
<td>0.1250</td>
<td>98.0</td>
</tr>
<tr>
<td>90.9</td>
<td>0.1375</td>
<td>98.1</td>
</tr>
<tr>
<td>90.8</td>
<td>0.1500</td>
<td>98.2</td>
</tr>
<tr>
<td>90.7</td>
<td>0.1625</td>
<td>98.3</td>
</tr>
<tr>
<td>90.6</td>
<td>0.1750</td>
<td>98.4</td>
</tr>
<tr>
<td>90.5</td>
<td>0.1875</td>
<td>98.5</td>
</tr>
<tr>
<td>90.4</td>
<td>0.2000</td>
<td>98.6</td>
</tr>
<tr>
<td>90.3</td>
<td>0.2125</td>
<td>98.7</td>
</tr>
<tr>
<td>90.2</td>
<td>0.2250</td>
<td>98.8</td>
</tr>
<tr>
<td>90.1</td>
<td>0.2375</td>
<td>98.9</td>
</tr>
<tr>
<td>90.0</td>
<td>0.2500</td>
<td>99.0</td>
</tr>
<tr>
<td>&lt; 90.0</td>
<td>Remove and Replace</td>
<td>&gt; 99.0</td>
</tr>
</tbody>
</table>

21. Use if the Standard construction process is specified and air voids content is 5%. Delete para 20 if using this para.

For each 250 tons of HMA production, the Engineer determines a deduction for percent of maximum theoretical density for each average of 3 density cores if it is outside the specifications, as follows:
### Reduced Payment Factors for Percent of Maximum Theoretical Density

<table>
<thead>
<tr>
<th>HMA Type A and B and RHMA-G Percent of Maximum Theoretical Density</th>
<th>Reduced Payment Factor</th>
<th>HMA Type A and B and RHMA-G Percent of Maximum Theoretical Density</th>
<th>Reduced Payment Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.0</td>
<td>0.0000</td>
<td>96.0</td>
<td>0.0000</td>
</tr>
<tr>
<td>90.9</td>
<td>0.0125</td>
<td>96.1</td>
<td>0.0125</td>
</tr>
<tr>
<td>90.8</td>
<td>0.0250</td>
<td>96.2</td>
<td>0.0250</td>
</tr>
<tr>
<td>90.7</td>
<td>0.0375</td>
<td>96.3</td>
<td>0.0375</td>
</tr>
<tr>
<td>90.6</td>
<td>0.0500</td>
<td>96.4</td>
<td>0.0500</td>
</tr>
<tr>
<td>90.5</td>
<td>0.0625</td>
<td>96.5</td>
<td>0.0625</td>
</tr>
<tr>
<td>90.4</td>
<td>0.0750</td>
<td>96.6</td>
<td>0.0750</td>
</tr>
<tr>
<td>90.3</td>
<td>0.0875</td>
<td>96.7</td>
<td>0.0875</td>
</tr>
<tr>
<td>90.2</td>
<td>0.1000</td>
<td>96.8</td>
<td>0.1000</td>
</tr>
<tr>
<td>90.1</td>
<td>0.1125</td>
<td>96.9</td>
<td>0.1125</td>
</tr>
<tr>
<td>90.0</td>
<td>0.1250</td>
<td>97.0</td>
<td>0.1250</td>
</tr>
<tr>
<td>89.9</td>
<td>0.1375</td>
<td>97.1</td>
<td>0.1375</td>
</tr>
<tr>
<td>89.8</td>
<td>0.1500</td>
<td>97.2</td>
<td>0.1500</td>
</tr>
<tr>
<td>89.7</td>
<td>0.1625</td>
<td>97.3</td>
<td>0.1625</td>
</tr>
<tr>
<td>89.6</td>
<td>0.1750</td>
<td>97.4</td>
<td>0.1750</td>
</tr>
<tr>
<td>89.5</td>
<td>0.1875</td>
<td>97.5</td>
<td>0.1875</td>
</tr>
<tr>
<td>89.4</td>
<td>0.2000</td>
<td>97.6</td>
<td>0.2000</td>
</tr>
<tr>
<td>89.3</td>
<td>0.2125</td>
<td>97.7</td>
<td>0.2125</td>
</tr>
<tr>
<td>89.2</td>
<td>0.2250</td>
<td>97.8</td>
<td>0.2250</td>
</tr>
<tr>
<td>89.1</td>
<td>0.2375</td>
<td>97.9</td>
<td>0.2375</td>
</tr>
<tr>
<td>89.0</td>
<td>0.2500</td>
<td>98.0</td>
<td>0.2500</td>
</tr>
<tr>
<td>&lt; 89.0</td>
<td>Remove and Replace</td>
<td>&gt; 98.0</td>
<td>Remove and Replace</td>
</tr>
</tbody>
</table>

22. **Use if chain wear may be a concern.**

HMA must comply with the following quality requirement when mixed with the asphalt used on the project in the amount determined to be optimum by California Test 367:

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Abrasion</td>
<td>CT 360</td>
<td>Loss not to exceed 0.4 g/cm²</td>
</tr>
</tbody>
</table>

**MATERIALS**

**Asphalt Binder**

23*. **Fill in the asphalt binder grade (use only PG 64-28 PM, PG 70-10, or PG 76-22 PM). Consult with the District Materials Engineer.**

The grade of asphalt binder mixed with aggregate for HMA Type C must be ____________. 
Aggregate

24*. Use the following table to determine the grading.

<table>
<thead>
<tr>
<th>Specified Total Thickness Range</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15 foot – 0.25 foot</td>
<td>1/2 - inch</td>
</tr>
<tr>
<td>0.25 foot and above</td>
<td>3/4 - inch</td>
</tr>
<tr>
<td>0.35 foot and above</td>
<td>1 - inch</td>
</tr>
</tbody>
</table>

The aggregate for HMA Type C must comply with the __________ grading.

25

Choose a sieve size target value (TV) within each target value limit presented in the following table:

<table>
<thead>
<tr>
<th>Aggregate Gradation (Percentage Passing)</th>
<th>HMA Type C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-inch HMA Type C</td>
<td></td>
</tr>
<tr>
<td>Sieve Sizes</td>
<td>Target Value Limits</td>
</tr>
<tr>
<td>1&quot;</td>
<td>100</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>88 - 93</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>72 - 85</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>55 - 70</td>
</tr>
<tr>
<td>No. 4</td>
<td>35 - 52</td>
</tr>
<tr>
<td>No. 8</td>
<td>22 - 40</td>
</tr>
<tr>
<td>No. 30</td>
<td>8 - 24</td>
</tr>
<tr>
<td>No. 50</td>
<td>5 - 18</td>
</tr>
<tr>
<td>No. 200</td>
<td>3 - 7</td>
</tr>
</tbody>
</table>
### 3/4–inch HMA Type C

<table>
<thead>
<tr>
<th>Sieve Sizes</th>
<th>Target Value Limits</th>
<th>Allowable Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>100</td>
<td>—</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>90 - 95</td>
<td>TV ±5</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>60 - 75</td>
<td>TV ±6</td>
</tr>
<tr>
<td>No. 4</td>
<td>35 - 52</td>
<td>TV ±7</td>
</tr>
<tr>
<td>No. 8</td>
<td>22 – 36</td>
<td>TV ±5</td>
</tr>
<tr>
<td>No. 30</td>
<td>8 - 18</td>
<td>TV ±4</td>
</tr>
<tr>
<td>No. 200</td>
<td>3 - 7</td>
<td>TV ±2</td>
</tr>
</tbody>
</table>

### 1/2–inch HMA Type C

<table>
<thead>
<tr>
<th>Sieve Sizes</th>
<th>Target Value Limits</th>
<th>Allowable Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100</td>
<td>—</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>90 - 98</td>
<td>TV ±6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>64 - 84</td>
<td>TV ±6</td>
</tr>
<tr>
<td>No. 4</td>
<td>42 - 57</td>
<td>TV ±7</td>
</tr>
<tr>
<td>No. 8</td>
<td>29 - 39</td>
<td>TV ±5</td>
</tr>
<tr>
<td>No. 30</td>
<td>13 - 19</td>
<td>TV ±4</td>
</tr>
<tr>
<td>No. 200</td>
<td>3 - 7</td>
<td>TV ±2</td>
</tr>
</tbody>
</table>

### 26

Before the addition of asphalt binder and lime treatment, aggregate must comply with:

<table>
<thead>
<tr>
<th>Aggregate Quality</th>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent of crushed particles a</td>
<td>CT 205</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coarse aggregate (% min.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Two fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine aggregate (% min.) (Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>One fractured face</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Los Angeles Rattler (% Max.) a</td>
<td>CT 211</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss at 100 rev.</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Loss at 500 rev.</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Sand equivalent a,b (min.)</td>
<td>CT 217</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Fine aggregate angularity (% min.) a</td>
<td>AASHTO T 304</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Flat and elongated particles (% max. by weight @ 5:1) a</td>
<td>ASTM D 4791</td>
<td>10</td>
</tr>
</tbody>
</table>

Note:

- a During lime treatment except for dry lime on damp aggregate treatment at continuous mixing plants, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the IMF proportions.
- b Reported value must be the average of 3 tests from a single sample.
Hot Mix Asphalt Type C Mixture

27*. Insert the percent air voids. Determine percent air voids based on the following table:

<table>
<thead>
<tr>
<th>Location</th>
<th>Mountain</th>
<th>Valley</th>
<th>Coast</th>
<th>Desert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveled way &amp; Shoulders</td>
<td>4.0</td>
<td>5.0</td>
<td>4.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Intersections and ramp</td>
<td>4.0</td>
<td>5.0</td>
<td>4.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>

During mix design, determine the optimum binder content (OBC) at ___ percent air voids content.

28
Determine the proposed JMF from a mix design that complies with:
### Hot Mix Asphalt Mix Design Requirements

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method or Lab Procedure</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design air voids content (%)</td>
<td>CT 367</td>
<td>4.0</td>
</tr>
<tr>
<td>Air voids content (%)</td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min.)</td>
<td>LP-2</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>14.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td>13.0</td>
</tr>
<tr>
<td>1&quot; grading with NMAS = 1&quot;</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>1&quot; grading with NMAS = 3/4&quot;</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>65.0 –</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td>75.0</td>
</tr>
<tr>
<td>1&quot; grading</td>
<td></td>
<td>65.0 –</td>
</tr>
<tr>
<td>Stabilometer value (min.)</td>
<td>CT 366</td>
<td>37°</td>
</tr>
<tr>
<td>Dust proportion c (P200/Pbe)</td>
<td>LP-4</td>
<td>0.6 – 1.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.6 – 1.3</td>
</tr>
</tbody>
</table>

Notes:
- a Calculate the air voids content of each specimen using CT 309 and LP-1. Modify CT 367, Paragraph C5, to use the exact air voids content specified in the selection of OBC.
- b Minimum VMA is dependent upon NMAS of JMF. NMAS is defined as one sieve size larger than the first sieve to retain more than 10 percent.
- c Asphalt content based on dry weight of aggregate
- d Modify CT 304, Part 2.B.2.c: "After compaction in the compactor, cool to 140 °± 5 °F by allowing the briquettes to cool at room temperature for 0.5-hour, then place the briquettes in the oven at 140 °F for a minimum of 2 hours and not more than 3 hours."
- e Follow CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.
- f Modify CT 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.

**29*. For Standard and Method process, use to require lime treatment of aggregates when recommended by the District Materials Engineer in the locations defined by the “Desert AC” Delegation (June 1, 2001).**

Add SSP 39-400.

**Antistrip Treatment**

Treat aggregate with lime slurry under "Hot Mix Asphalt Aggregate Lime Treatment – Slurry Method” and use Lab Procedure LP-7 for the mix design.

**CONSTRUCTION**

**30. Use for 1/2 – inch aggregate gradation**

Pave HMA Type C in maximum 0.25-foot thick compacted layers.
31. **Use for 3/4-inch aggregate gradation**
   Pave HMA Type C in maximum 0.35-foot thick compacted layers.

32. **Use for 1-inch aggregate gradation**
   Pave HMA Type C in maximum 0.45-foot thick compacted layers.

Paras 33 through 42 are miscellaneous clauses for HMA Type C projects. Delete paragraphs that do not apply. Delete Subheadings when appropriate.

33. **Use when rumble strips are shown on the plans. Include SSP 39-350 if using this para.**

**Rumble Strips**
Construct rumble strips in the top layer of new HMA surfacing.

**Vertical Joints**

34. **Use on 2-lane highways where the thickness of HMA is 0.15 foot or less and the vertical joint between lanes is to be kept to a minimum. Do not use this para with Para 37.**
   If you perform half-width paving, at the end of each day's work the distance between the ends of adjacent surfaced lanes must not be greater than can be completed in the following day of normal paving.

35. **Use when shoulders or median borders are to be paved.**
   Before opening the lane to traffic, pave shoulders and median borders adjacent to a lane being paved.

36. **Use on projects or portions of projects with HMA Type C surfacing thicker than 0.15 foot. Delete this para if Para 37 is used.**
   Do not leave a vertical joint more than 0.15 foot high between adjacent lanes open to public traffic.

37. **Use if a vertical joint is not allowed between lanes open to traffic, regardless of thickness.**
   Place HMA Type C on adjacent traveled way lanes so that at the end of each work shift, the distance between the ends of HMA Type C layers on adjacent lanes is between 5 feet and 10 feet. Place additional HMA Type C 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 Type C to form temporary conforms. You may place kraft paper or another approved bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.
Widening

38. Use for widening if the new pavement structure is to be placed to the elevation of the existing surfacing for the entire length of the project before placing the uppermost layer of HMA Type C. If a surface type other than HMA Type C is to be placed on the existing pavement, edit "HMA Type C" to match the type. Delete "on both sides of the existing pavement," if widening is only on one side.

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

39. Use when widening is not continuous for the entire length of the project, and the new pavement structure is to be constructed to the elevation of the existing surfacing at each location of the widening before placing the uppermost layer of HMA Type C at each location. If a surface type other than HMA Type C is to be placed on the existing pavement, edit "HMA Type C" to match the type. Delete "on both sides of the existing pavement," if widening is only on one side.

If widening existing pavement, construct the 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 Type C over the existing pavement.

40*. Use when the pavement structure is to be constructed to the elevation of the existing surfacing for the specified lengths before placing the uppermost layer of HMA Type C at each location. If a surface type other than HMA Type C is to be placed on the existing pavement, edit "HMA Type C" to match the surface type. Fill in the increment. Delete "on both sides of the existing pavement," if widening is only on one side.

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 in increments of at least _____ feet before placing HMA Type C over the existing pavement.

Conform Tapers

41. Use when conform tapers are used in place of paving shoulders and/or median shoulders.

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

42. DO NOT use for paving driveways and road connections. This paragraph covers the short conform taper at the edge of pavement.

Place additional HMA Type C along the pavement's edge to conform to road connections and private drives. Hand rake, if necessary, and compact the additional HMA Type C to form a smooth conform taper.
43. If there is no paving on the travelled way or if the length of the project is less than 1 mile, delete Paras 43 through 47.

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

44
Take 4-inch 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

45
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.

46
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

PAYMENT
47
The contract lump sum price paid for data core includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in data coring, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
4. JOINTED PLAIN CONCRETE PAVEMENT (RAPID STRENGTH CONCRETE)

New nSSP Approved for use on EA XXXXXX by XXXXXX on XXXXX
40-JPCPRSC_N12-22-11_nSSP
Page 1 of 25

Edit in plain language.

This nSSP requires written approval from HQ Pavement Program, Office of Concrete Pavement and Pavement Foundations to use. Include drawings indicating where and how this spec will be used including title sheet, typical sections, layouts, construction details, quantity and any other sheets where details for this product are found. Please limit edits to those in the instructions. Additional edits will require substantiation as to why they are necessary and may require providing documentation to demonstrate that because of claims, special conditions, or other reasons modified language is necessary. Please plan on 2 weeks for review if spec is only edited as per contained instructions and at least 4 weeks if additional edits are made.

Use for new construction and/or lane replacement of jointed plain concrete pavement with rapid strength concrete. Do not use this nSSP for slab replacement. Slab replacement is defined as replacing individual concrete slabs within an existing concrete pavement to the same thickness as existing. Lane replacement and new construction involves placing concrete pavement within defined limits (e.g. between bridges, ramp termini, bridge approaches, etc.) and must meet the design standards and traffic loads for new construction of pavements as defined in the Highway Design Manual Chapter 610 and 620. Provide station limits on the plans where new construction and/or lane replacement with rapid strength concrete will be used.

Provide adequate number of working days to cover the time required for the Contractor to determine concrete mix proportions as specified in Section 40 of the Standard Specifications. Factor in the delayed start time if using SSP S4-003 (used for projects over $5 million and 200 working days under a 2-year pilot program). METS - Rigid Pavement & Structural Concrete Unit estimates 90 days is required before starting concrete pavement work.

District Materials Engineer and District Maintenance should recommend a joint seal type. Select one joint seal type from silicone, asphalt rubber, or compression seal.

Include dowel bars, tie bars and baskets in SSP S5-250 for partial payment of materials on hand.

Use BEES Item Codes:

401050A Jointed Plain Concrete Pavement (Rapid Strength Concrete)
401050B Jointed Plain Concrete Pavement (Ramp Termini with Rapid Strength Concrete) if ramp termini are part of the project.
404092 Seal Pavement Joint
404093 Seal Isolation Joint

For lane replacement, include specifications and separate bid items to remove existing pavement and base. If replacing or removing existing concrete pavement, include specifications and item codes for “Remove Concrete Pavement” and “Roadway Excavation” as needed.

Include SSP 40-026 for JITT if recommended by District Construction.

If adding a lane or shoulder, include spall repair as a first order of work paid for with a separate item. Include SSPs 42-050 (pavement grinding) and 41-150 or 41-151 for spall repairs.

Add SSPs S8-C16 (Quality Control Program) if the Engineer's Estimate includes 2,000 cubic yards or more of concrete pavement.

Add SSPs 40-200 or 40-210 and BEES item codes as applicable for shoulder rumble strips.

Include applicable Standard Plans P1 through P46.

10-1. JOINTED PLAIN CONCRETE PAVEMENT (RAPID STRENGTH CONCRETE)

GENERAL

Summary

This work includes constructing jointed plain concrete pavement (JPCP) with rapid strength concrete (RSC).

2

Comply with Section 40, "Concrete Pavement," of the Standard Specifications.

3

Definitions

early age: Time less than 10 times the concrete's final set time.
final set time: Time a specific penetration resistance of 4,000 psi is achieved, determined under ASTM C 403.
opening age: Time the concrete achieves the specified strength for opening to traffic.
transverse crack: A crack running from one longitudinal edge of the panel to the other.

Submittals

4.

Submit AASHTO T 336 coefficient of thermal expansion test results to the Engineer and at the website http://169.237.179.13/cte/.

5. Delete if Paras 28 through 38 are deleted.

For rejected test strips, submit a plan for changed materials, methods, or equipment before constructing additional test strips.
Quality Control and Assurance

General

6. Include if concrete shoulders will be used as a future traffic lane.

Perform profilograph testing on concrete shoulders. Testing and test results must comply with the specifications for concrete pavement smoothness, profilograph test procedure, and corrective action for traffic lanes.

Prepaving Conference

7

Meet with the Engineer at a prepaving conference at a mutually agreed time and place. Discuss methods of performing the production and paving work.

8

Prepaving conference attendees must sign an attendance sheet provided by the Engineer. The prepaving conference must be attended by your:

1. Project superintendent
2. Quality control manager
3. Paving construction foreman
4. Subcontractor's workers including:
   4.1. Foremen
   4.2. Concrete plant manager
   4.3. Concrete plant operator
   4.4. Personnel performing saw cutting and joint sealing

9. Delete "including test strips" if Paras 28 through 38 are deleted.

Do not start paving activities including test strips until the listed personnel have attended a prepaving conference.

Mix Design

10

At least 10 days before use, submit a mix design for RSC that includes:

1. Opening age
2. Proposed aggregate gradation
3. Proportions of hydraulic cement and aggregate
4. Types and amounts of chemical admixtures
5. Maximum time allowed between batching and placing
6. Range of ambient temperatures over which the mix design is effective
7. Final set time
8. Any special instructions or conditions such as water temperature requirements
11

Submit more than 1 mix design to plan for ambient temperature variations anticipated during RSC placement. Each mix design must have a maximum ambient temperature range of 18 °F.

12

Submit modulus of rupture development data for each mix design. You may use modulus of rupture development data from laboratory-prepared samples. The testing ages for modulus of rupture development data must include 1 hour before opening age, opening age, one hour after opening age, 24 hours, 7 days, and 28 days.

12a

During concrete mix design, perform coefficient of thermal expansion testing under AASHTO T 336 from trial mixture samples. Provide a split test sample to METS. If changing an aggregate supply source or the mix properties or proportions, perform coefficient of thermal expansion testing for the new concrete mix.

Calibration Testing Certificates of Compliance

13

Submit a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications with each delivery of aggregate, cement, and admixtures to be used for calibration tests. Submit certified copies of the weight of each delivery. The Certificate of Compliance must state the source of materials used for the calibration tests is from the same source to be used in the work. The Certificate of Compliance must be signed by your authorized representative.

Cement and Admixtures

14. Do not edit the number of days without approval from district materials laboratory and METS, Office of Structural Materials.

At least 45 days before intended use, submit a sample of cement from each proposed lot and samples of proposed admixtures in the quantities ordered by the Engineer.

15

During RSC pavement operations, submit uniformity reports for hydraulic cement at least once every 30 days to the Transportation Laboratory, Attention: Cement Laboratory. Uniformity reports must comply with ASTM C 917, except testing age and water content may be modified to suit the particular material.
Paras 16 through 60: Include if the quantity of JPCP (RSC) is $\geq 300$ cubic yards.

Quality Control Program

General

16

Establish a quality control program. The quality control program assures the Engineer that methods and procedures are in place to produce and place RSC in compliance with the specifications.

17

If the quality control program is not implemented and followed, the Engineer orders RSC work stopped.

Quality Control Managers

18

For the project, designate a lead QCM and assistant QCMs.

19

The lead QCM administers the quality control plan (QCP). The lead QCM must hold current American Concrete Institute (ACI) certification as "Concrete Field Testing Technician-Grade I" and "Concrete Laboratory Testing Technician-Grade II." Assistant QCMs must hold current ACI certification as "Concrete Field Testing Technician-Grade I" and either "Concrete Laboratory Testing Technician-Grade I" or "Concrete Laboratory Testing Technician-Grade II."

20 If paragraphs 39 and 40 are used in lieu of paragraphs 28 through 38, edit to say “trial slab” instead of “test strip”

The QCM responsible for the production period involved must review and sign the sampling, inspection, and test reports before submittal to the Engineer. At least 1 QCM must be present for:

1. Each stage of mix design
2. Test strip construction
3. Production and construction of RSC
4. Meetings with the Engineer relating to production, placement, or testing.

21

A QCM must not be a member of this project's production or paving crews, an inspector, or a tester. A QCM must have no duties during the production and placement of RSC except those specified.

Quality Control Plan

22

The QCP describes the procedures you will use to control the production process including:
1. Determining if changes to the production process are needed
2. Procedures for proposing changes
3. Procedures for implementing changes

23 If paragraphs 39 and 40 are used in lieu of paragraphs 28 through 38, edit to say “trial slab” instead of “test strip”

Do not start RSC work until the QCP has been accepted by the Engineer. The Engineer accepts the QCP based on the inclusion and adequacy of:

1. The names and qualifications of the lead Quality Control Manager (QCM) and assistant QCMs.
2. An outline procedure for the placement and testing of test strips
3. An outline procedure for the production, transportation, and placement of RSC
4. An outline procedure for sampling and testing to be performed during and after RSC construction
5. A contingency plan for correcting problems in production, transportation, or placement. Include the quantity and location of standby material in your contingency plan.
6. Provisions for determining if RSC placement must be suspended and temporary roadway pavement structure constructed
7. Forms to report inspection, sampling, and testing
8. The location of your quality control testing laboratory and testing equipment during and after paving operations
9. A list of the testing equipment to be used including date of last calibration
10. The names and certifications of quality control personnel including those performing sampling and testing

24

At the time of QCP submission, the Department qualifies the quality control samplers and testers through the Independent Assurance Program (IAP) for the sampling and testing they perform.

Quality Control Inspection, Sampling, and Testing

25

Perform quality control sampling, testing, and inspection throughout RSC production and placement. Before any sampling and testing, give the Engineer at least 2 business days notice. Give the Engineer unrestricted access to your quality control inspectors, samplers, testers, and laboratories. Submit testing results within 15 minutes of testing completion. Record inspection, sampling, and testing on the forms accepted with the QCP and submit them within 48 hours of completion of each paving shift and within 24 hours of 7-day modulus of rupture tests.

26

Provide a testing laboratory to perform quality control tests. Maintain sampling and testing equipment in proper working condition. Perform sampling under California Test 125.
27

Testing laboratories and testing equipment must comply with the Department's Independent Assurance Program.

Delete Paras 28 through 38 if there is less than 2,000 cubic yards of jointed plain concrete pavement (rapid strength concrete) or no segment that is at least 700 feet in length on the project and delete the heading.

Test Strips

28

The first paving activity must be to construct a test strip:

1. 700 to 1,000 feet long
2. Same width as the planned paving
3. With the same equipment used for the planned paving

29

The Engineer evaluates the test strip for compliance with the specifications for Engineer's acceptance.

30

The Engineer selects from 6 to 12 core locations for dowel bars and up to 6 locations for tie bars per test strip.

31

If you use mechanical dowel bar inserters, the test strip must demonstrate they do not leave voids, segregations, or surface irregularities such as depressions, dips, or high areas.

32

Allow the Engineer 3 days to evaluate the test strip for:

1. Smoothness
2. Dowel bar and tie bar alignment
3. Thickness
4. Final finishing except coefficient of friction

33

During the 3-day evaluation, the Engineer rejects a test strip if:

1. Surface varies more than 0.02 foot from a 12-foot straightedge's lower edge
2. Wheel path's individual high points are greater than 0.025 foot in 25 feet
3. Dowel bars do not comply with specified placement tolerances
4. Concrete pavement thickness deficiency is greater than 0.05 foot
5. Final finishing does not comply with the specifications except coefficient of friction
34
Remove the test strip if the Engineer rejects it for noncompliance with the specifications for dowel bar alignment or thickness. Dispose of rejected test strip material under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

35
If the Engineer rejects the test strip for noncompliance with the smoothness or final finishing specifications except coefficient of friction, you may grind the test strip into compliance if you intend to leave it as part of the paving.

36
If the Engineer does not reject the test strip during the 3-day evaluation, you may begin production paving while the Engineer continues to evaluate the test strip for compliance with the other specifications. If the Engineer rejects the test strip for noncompliance with the other specifications, stop production paving until you construct a test strip the Engineer accepts.

37
Construct additional test strips until the Engineer accepts one.

38
Construct additional test strips if:

1. You propose different paving equipment including:
   1.1. Batch plant
   1.2. Paver
   1.3. Dowel bar inserter
   1.4. Tie bar inserter
   1.5. Tining
   1.6. Curing equipment

2. You change concrete mix proportions

Paras 39 through 40: Delete when paragraphs 28 through 38 are used.

Trial Slabs

39
Before starting work on RSC, complete one trial slab for each rapid strength concrete mix design. Trial slabs demonstrate that you are capable of producing replacement concrete pavement in compliance with the specifications within the specified time periods including delivery, placement, finishing, and curing times, and under similar atmospheric and temperature conditions expected during replacement operations.

40
The trial slab must be at least 10' x 20'. The trial slab thickness must be at least 10 inches. Place trial slabs near the job site at a mutually-agreed location that is neither on the roadway nor within the project limits.
If paragraphs 39 and 40 are used in lieu of paragraphs 28 through 38, edit paragraphs 41 through 47 to say “trial slab” instead of “test strip”

41.
During test strip construction, sample and split the aggregate for gradings, cleanness value, and sand equivalent testing.

42.
Test strip must comply with the QCP for RSC production and placement. The QCP must detail your intended:

1. Locations and times
2. Production procedures
3. Placement and finishing methods
4. Sampling methods, sample curing, and sample transportation
5. Testing and test result reporting

43
Within 20 minutes after rapid strength concrete delivery for test strips, fabricate test beams under California Test 524. Use beams to determine early age and 7-day modulus of rupture values.

44
Cure beams fabricated for early age testing so that the monitored temperatures in the beams and the test strip are always within 5 °F. Monitor and record the internal temperatures of test strip and early age beams at intervals of at least 5 minutes. Install thermocouples or thermistors connected to strip-chart recorders or digital data loggers to monitor the temperatures. Temperature recording devices must be accurate to within ±2 °F. Measure internal temperatures at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge until early age testing is completed.

45
Cure beams fabricated for 7-day testing under California Test 524 except place them into sand at a time that is from 5 to 10 times the final set time, or 24 hours, whichever is earlier.

46
Test strip must have an early age modulus of rupture of not less than 400 psi and a 7-day modulus of rupture of not less than 600 psi.

47
Dispose of test strip and test specimens for test strip under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Production Process Control and Quality Control Testing

48
Contingency plan equipment and personnel must be present at the job site.
49

Provide continuous process control and quality control sampling and testing throughout RSC production and placement.

50

During production of RSC, sample and test aggregates at least once for every 650 cubic yards of RSC produced, but not less than once per placement shift. Test aggregates for compliance with gradations, cleanliness value, and sand equivalent specifications.

51

At least once for every 650 cubic yards of RSC produced, but not less than twice per placement shift, sample and test for:

1. Yield
2. Penetration
3. Air content
4. Unit weight

52

During placement of RSC, fabricate beams and test for modulus of rupture within the first 30 cubic yards, at least once every 130 cubic yards, and within the final truckload.

53

If the Engineer requests, submit split samples and fabricate test beams for the Engineer's testing.

54

For determining early age modulus of rupture, cure beams under the same conditions as the pavement until 1 hour before testing. Cure beams fabricated for the 7-day test under California Test 524. The Engineer uses modulus of rupture test results for accepting or rejecting the replacement pavement and pay factor adjustment for low modulus of rupture.

55

Dispose of materials resulting from the construction of the test beams, temporary roadway pavement structure, and rejected replacement pavement under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Weighmaster Certificates

56

Weighmaster certificates for RSC, regardless of the proportioning method used, must include the information necessary to trace the manufacturer and the manufacturer's lot number for the cement being used. If proportioned into fabric containers, the weighmaster certificates for the cement must contain date of proportioning, location of proportioning, and actual net draft cement weight. If proportioned at the pour site from a storage silo, the weighmaster certificates must contain date of proportioning, location of proportioning, and the net draft cement weight used in the load.
Engineer's Acceptance for Modulus of Rupture

RSC pavement must develop a minimum modulus of rupture of 400 psi before opening to traffic. RSC pavement must develop a minimum modulus of rupture of 600 psi 7 days after placement. The Engineer may accept RSC pavement that does not attain the specified moduli of rupture as specified in "Pay Factor Adjustment for Low Modulus of Rupture." You will determine the modulus of rupture by testing 3 beam specimens under California Test 524 and averaging the results in the presence of the Engineer. You may fabricate beam specimens using an internal vibrator under ASTM C 31. No single test represents more than that day's production or 130 cubic yards, whichever is less.

Beam specimens for early age must be cured so the temperature in the specimens is within 5 °F of the temperature in the pavement. You must determine the modulus of rupture at other ages using beams cured and tested under California Test 524 except place them in sand from 5 to 10 times the final set time or 24 hours, whichever is earlier. You must perform the testing to determine modulus of rupture values of the RSC pavement in the presence of the Engineer.

Pay Factor Adjustment for Low Modulus of Rupture

The Engineer adjusts payment for RSC for modulus of rupture as follows:

1. Payment for RSC with a modulus of rupture of 400 psi or greater before opening to traffic and 7-day modulus of rupture of 600 psi or greater is not adjusted.
2. Payment for RSC with a 7-day modulus of rupture less than 500 psi is not adjusted and no payment is made. Remove this RSC and replace it at your expense with RSC that complies with the specifications.
3. Payment for RSC with a modulus of rupture less than 350 psi before opening to traffic is not adjusted and no payment is made. Remove this RSC and replace it at your expense with RSC that complies with the specifications.
4. Payment for RSC with a modulus of rupture of 350 psi or greater before opening to traffic and a 7-day modulus of rupture greater than or equal to 500 psi is reduced by the percentage in the pay table for the quantity represented by the tests.

<table>
<thead>
<tr>
<th>Percentage Pay Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulus of Rupture (psi) at opening to traffic</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Greater than or equal to 400</td>
</tr>
<tr>
<td>Less than 400 and greater than or equal to 350</td>
</tr>
<tr>
<td>Less than 350</td>
</tr>
</tbody>
</table>
The Engineer rejects any RSC area that develops 1 or more transverse full depth random cracks within 64 days after placement. Remove this RSC at your expense and replace it with RSC that complies with the specifications.

MATERIALS

Temporary Roadway Pavement Structure

Aggregate Base

Aggregate base for temporary roadway pavement structure must be produced from any combination of broken stone, crushed gravel, natural rough-surfaced gravel, reclaimed concrete and sand. Grading of aggregate base must comply with the 3/4-inch maximum grading specified in Section 26-1.02A, "Class 2 Aggregate Base," of the Standard Specifications.

Hot Mix Asphalt

For hot mix asphalt:

1. Choose the 3/8-inch or 1/2-inch HMA Type A or Type B aggregate gradation under Section 39-1.02E, "Aggregate," of the Standard Specifications.
2. Minimum asphalt binder content must be 6.8 percent for 3/8-inch aggregate gradation and 6.0 percent for 1/2-inch aggregate gradation.
3. Choose asphalt binder Grade PG 64-10, PG 64-16, or PG 70-10 under Section 92, "Asphalts," of the Standard Specifications.

Rapid Strength Concrete

RSC that fails to meet opening strength but has a modulus of rupture of at least 200 psi may serve as temporary roadway and must be replaced prior to acceptance of the contract.

Bond Breaker

Bond breaker must be one of the following:

1. White curing paper under ASTM C 171
2. White opaque polyethylene film under ASTM C 171, except that the minimum thickness must be 6 mils
3. Paving asphalt, Grade PG 64-10, under Section 92, "Asphalts," of the Standard Specifications
4. Curing compound (5) under Section 90-7.01b, "Curing Compound Method," of the Standard Specifications
Rapid Strength Concrete

RSC must be one of the following:
1. Concrete complying with section 90 “Portland Cement Concrete”, except you may use Type III portland cement.
2. Concrete complying with section 90 “Portland Cement Concrete”, except:
   2.1. You may use any cement that complies with the definition of hydraulic cement or blended hydraulic cement in ASTM C 219 and the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraction in air</td>
<td>California Test 527. W/C Ratio = 0.39 ± 0.010</td>
<td>0.053 %, max.</td>
</tr>
<tr>
<td>Mortar expansion in water</td>
<td>ASTM C 1038</td>
<td>0.04 %, max.</td>
</tr>
<tr>
<td>Soluble chloride</td>
<td>California Test 422</td>
<td>0.05 %, max.</td>
</tr>
<tr>
<td>Soluble sulfates</td>
<td>California Test 417</td>
<td>0.30 %, max.</td>
</tr>
<tr>
<td>Thermal stability</td>
<td>California Test 553</td>
<td>90 %, min.</td>
</tr>
<tr>
<td>Compressive strength @ 3 days</td>
<td>ASTM C 109</td>
<td>2,500 psi</td>
</tr>
</tbody>
</table>

Note:
- Perform test on a cube specimen fabricated under ASTM C 109. Cure the specimen at least 14 days and then pulverized to 100 percent passing the No. 50 sieve.
- If you use chemical admixtures, include them when testing.
- The requirements of this table do not apply to portland cement.

2.2. You may use citric acid or borax if you submit a written request from the cement manufacturer and a test sample.
Section 40-2.01C does not apply.

67

Supplementary cementitious material is not required in RSC.

68

Choose the combined aggregate grading for RSC from either the 1-1/2 inch maximum or the 1-inch maximum combined grading under Section 90-3.04, "Combined Aggregate Gradings," of the Standard Specifications.

Aggregate for RSC must be either:
1. Innocuous in conformance with the provisions in Section 90-2.02, "Aggregates."
2. When tested under ASTM C 1567 using the proposed aggregate and cementitious materials, the expansion is less than 0.10 percent. Submit test data with each mix design. Test data authorized by the Department no more than 3 years before the 1st day of the Contract is
authorized for the entire Contract. The test data must be for the same concrete mix and must use the same materials and material sources to be used on the Contract.

69

You may use Type C accelerating and Type E accelerating and water reducing chemical admixtures as specified in Section 90-4, "Admixtures," of the Standard Specifications. The requirement for air entrainment of concrete in freeze-thaw areas only applies when portland cement is used.

69A

During concrete mix design, perform coefficient of thermal expansion testing under AASHTO T 336 from trial mixture samples. If changing an aggregate supply source or the mix properties or proportions, perform coefficient of thermal expansion testing for the new concrete mix. This test will not be used for acceptance.

Bar Reinforcement

70. Use Paras 70 through 72 in the high desert climate region and the mountain climate regions or if pavement is placed within 1,000 feet of an ocean or other salt water body, otherwise delete and delete heading. Refer to the Pavement Climate Map on the Pavement website at:

http://www.dot.ca.gov/hq/oppd/pavement/Pavement_Climateregions_100505.pdf

Bar reinforcement must be one of the following:

1. Epoxy coated steel reinforcing bar:
   1.1. Bar must comply with ASTM A 615/A 615M, Grade 40 or 60; ASTM A 996/A 996M; or ASTM A 706/A 706M.
   1.2. Epoxy coating must comply with ASTM A 934/A 934M. Epoxy coating must be purple or gray and handled at the manufacturing plant and job site under ASTM D 3963/D 3963M and Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications.

2. Low carbon, chromium steel bar:
   2.1. Low carbon, chromium steel bar must comply with ASTM A 1035/A 1035 M.

Dowel Bar and Dowel Bar Baskets

71

Dowel bar and dowel bar baskets must be one of the following:

1. Epoxy coated steel reinforcing bar
   1.1. Reinforcing bar must comply with ASTM A 615/A 615M, Grade 40 or 60.
   1.2. Epoxy coating must comply with ASTM A 884/A 884M, Class A, Type 2. Epoxy coating must be purple or gray.

2. Stainless steel bar:
2.1. Stainless steel bar must be descaled, pickled, and polished solid stainless steel bars, UNS Designation S31603 or S31803, Grade 60 under ASTM A 276/A 276M, and ASTM A 955/A 955M.

2.2. If placed under the basket placing method, stainless steel baskets must comply with ASTM A 493/A 493M, UNS S31600 or S31603.

Tie Bar and Tie Bar Baskets

Tie bar and tie bar baskets must be one of the following:

1. Epoxy coated steel reinforcing bar:
   1.1. Bar reinforcing must comply with ASTM A 615/A 615M, Grade 40 or 60; ASTM A 996/A 996M; or ASTM A 706/A 706M
   1.2. Epoxy coating for deformed tie bars must comply with ASTM A 934/A 934M. Epoxy coating must be purple or gray.
   1.3. Epoxy coating for smooth tie bars and tie bar baskets must comply with ASTM A 884/A 884M, Class A, Type 2.

2. Stainless steel bar:
   2.1. Stainless steel bar must be descaled, pickled, and polished solid stainless steel bars UNS Designation S31603 or S31803, Grade 60 under ASTM A 955/A 955M. If placed under the basket placing method, baskets must be stainless steel under ASTM A 493/A 493M, UNS S31600 or S31603.

Liquid Joint Sealant

73*. Specify type(s) of joint (e.g., longitudinal contraction joint) and silicone or asphalt rubber sealant. Delete if only compression joint seals are specified and delete heading.

Liquid joint sealant for ________________ must be ________________.

Liquid Joint Sealant for Isolation Joints

74*. Specify silicone or asphalt rubber sealant. Match the liquid joint sealant specified in Para 73. Do not use compression joint seals for isolation joints. Edit type, otherwise delete and delete heading.

Liquid joint sealant for isolation joints must be ________________.

Joint Seal

75*. Specify type(s) of joint (e.g., longitudinal, contraction joint). Delete if compression joint seals are not specified and delete heading.

Use compression seal for ______.
Joint Filler for Isolation Joints

76*. Specify bituminous expansion joint filler, Type 1 preformed expansion joint filler or Type 2 performed expansion joint filler. Edit type, otherwise delete and delete heading.

Joint filler for isolation joints must be ________________________.

Tack Coat

77

Tack coat must comply with Section 39, "Hot Mix Asphalt," of the Standard Specifications.

CONSTRUCTION

Tie Bar Spacing On Curves

78

If the curvature of a concrete pavement slab prevents equal spacing of tie bars to maintain the minimum clearance from transverse joints, space them from 15 to 18 inches.

Transverse Contraction Joints

79*. Edit to specify type, otherwise delete and delete heading. Choose Type A1 or Type B. Edit consistent with Para 73.

Transverse contraction joints must be Type _____. If widening existing concrete pavement, do not construct transverse contraction joints to match the existing pavement's joint spacing or skew unless specified. Transverse joints in concrete pavement on a curve must be on a single straight line through the curve's radius point.

Longitudinal Contraction Joints

80*. Edit to specify type, otherwise delete and delete heading. Choose Type A2 or Type B. Edit consistent with Para 73.

Longitudinal contraction joints must be Type _____.

Transition Joints With Hot Mix Asphalt

81

If a joint between concrete pavement and hot mix asphalt is specified, apply tack coat between the concrete pavement and hot mix asphalt.

Temporary Roadway Pavement Structure

82

Place hot mix asphalt and aggregate base where existing pavement is replaced for construction of a temporary roadway pavement structure. The quantity must be equal to the quantity of pavement removed during the work shift. If you place temporary roadway pavement structure, it must be maintained and later removed as the first order of work when JPCP (RSC) activities resume. The temporary roadway pavement structure must consist of 3-1/2 inch thick
hot mix asphalt over aggregate base. RSC not conforming to the specifications may be used for temporary roadway pavement structure with the Engineer's approval.

83

Spread and compact aggregate base and hot mix asphalt by methods that produce a well-compacted, uniform base, with a surface of uniform smoothness, texture and density. Surfaces must be free from pockets of coarse or fine material. You may spread aggregate base and hot mix asphalt each in one layer. The finished surface of hot mix asphalt must not vary more than 0.05 foot from the lower edge of a 12-foot long straightedge placed parallel with the centerline and must match the elevation of existing concrete pavement along the joints between the existing pavement and temporary surfacing.

84

After removing temporary roadway pavement structure, you may stockpile removed aggregate base at the project site and reuse it for temporary roadway pavement structures. When no longer required, dispose of standby material or stockpiled material for temporary roadway pavement structures under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Rapid Strength Concrete

General

85

Concrete pavement penetration specified in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications does not apply to RSC.

86

RSC must develop the specified opening age and 7-day modulus of rupture strengths.

Proportioning

87

Weighing, measuring, and metering devices used for proportioning materials must comply with Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

88. Delete Item 4 if Paras 103 through 131 are deleted (volumetric proportioning).

For batches with a volume of 1 cubic yard or more, proportioning must comply with one of the following methods:

1. Batch the ingredients at a central batch plant and charge them into a mixer truck for transportation to the pour site. Proportion ingredients under Section 90-5, "Proportioning," of the Standard Specifications.
2. Batch the ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a cement silo and weigh system, which must proportion cement for charging into the mixer truck.
3. Batch ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a location where pre-weighed containerized cement is added to the mixer truck. The cement pre-weighing operation must utilize a platform scale. The platform scale must have a maximum capacity of 2.75 tons with a maximum graduation size of 1 pound. Pre-weigh cement into a fabric container. The minimum amount of cement to be proportioned into any single container must be 1/2 of the total amount required for the load of RSC being produced.

4. Cement, water, and aggregate are proportioned volumetrically.

For central batch plants, indicators for weighing and measuring systems such as over and under dials must be grouped so that each indicator's smallest increment can be accurately read from the control point of the proportioning operation. In addition, indicators for weighing and measuring cement batched from a remote weighing system must be placed so that each indicator can be accurately read from the control point of the proportioning operation.

Weighing equipment must be insulated from other equipment's vibration or movement. When the plant is operating, each draft's material weight must not vary from the designated weight by more than the specified tolerances. Each scale graduation must be 0.001 of the usable scale capacity.

Aggregate must be weighed cumulatively. Equipment for weighing aggregate must have a zero tolerance of ±0.5 percent of the aggregate's designated total batch weight. Equipment for the separate weighing of the cement must have a zero tolerance of ±0.5 percent of the cement's designated individual batch draft. Equipment for measuring water must have a zero tolerance of ±0.5 percent of the water's designated weight or volume.

The weight indicated for any individual batch of material must not vary from the preselected scale setting by more than:

<table>
<thead>
<tr>
<th>Material</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>±1.0 percent of designated batch weight</td>
</tr>
<tr>
<td>Cement</td>
<td>±0.5 percent of designated batch weight</td>
</tr>
<tr>
<td>Water</td>
<td>±1.5 percent of designated batch weight or volume</td>
</tr>
</tbody>
</table>

Proportioning consists of dividing the aggregate into the specified sizes and storing them in separate bins, and then combining the aggregate with cement and water. Proportion dry ingredients by weight. Proportion liquid ingredients by weight or volume.

95

Control aggregate discharged from several bins with gates or mechanical conveyors. The means of discharge from the bins and from the weigh hopper must be interlocked so that no more than 1 bin can discharge at a time, and the weigh hopper cannot be discharged until the required quantity from each of the bins has been deposited in the weigh hopper.

96

At the time of batching, dry and drain aggregates to a stable moisture content. Do not proportion aggregates with visible separation of water from the aggregate during proportioning. At the time of batching, the free moisture content of fine aggregate must not exceed 8 percent of its saturated, surface-dry weight.

97

If the proportioning plant has separate supplies of the same size group of aggregate with different moisture content, specific gravity, or surface characteristics affecting workability, exhaust 1 supply before using another supply.

98

Keep cement separated from the aggregate until discharged into the mixer. When discharged into the mixer, cement must be free of lumps and clods. Before reuse, clean fabric containers used for transportation or proportioning of cement.

99

Weigh systems for proportioning aggregate and cement must be individual and distinct from other weigh systems. Each weigh system must have a hopper, a lever system, and an indicator.

100

When ordered by the Engineer, determine the gross weight and tare weight of truck mixers on scales designated by the Engineer.

101

Install and maintain in operating condition an electrically actuated moisture meter. The meter must indicate on a readily visible scale the changes in the fine aggregate moisture content as it is batched. The meter must have a sensitivity of 0.5 percent by weight of the fine aggregate.

102

Obtain the Engineer's acceptance before mixing water into the concrete during hauling or after arrival at the delivery point. If the Engineer accepts additional water be incorporated into the concrete, the drum must revolve not less than 30 revolutions at mixing speed after the water is added and before starting discharge. Measure water added to the truck mixer at the job site through a meter in compliance with Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.
Paras 103 through 131: Delete unless "Volumetric Proportioning" is recommended by the District Materials Engineer and approved by District Construction. Discuss with District or Headquarters Weights and Measures Coordinator and METS, Office of Structural Materials.

Volumetric Proportioning

103
You may choose to proportion RSC by volume.

104

105
Batch-mixer trucks must proportion cement, water, aggregate, and additives by volume. Aggregate feeders must be connected directly to the drive on the cement vane feeder. The cement feed rate must be tied directly to the feed rate for the aggregate and other ingredients. Only change the ratio of cement to aggregate by changing the gate opening for the aggregate feed. The drive shaft of the aggregate feeder must have a revolution counter reading to the nearest full or partial revolution of the aggregate delivery belt.

106
Proportion aggregate with a belt feeder operated with an adjustable cutoff gate delineated to the nearest quarter increment. The gate opening height must be readily determinable. Proportion cement by any method that complies with the accuracy tolerance specifications. Proportion water with a meter under Section 9-1.01, "Measurement and Payment," of the Standard Specifications.

107
Calibrate the cutoff gate for each batch-mixer truck used and for each aggregate source. Calibrate batch-mixer trucks at 3 different aggregate gate settings that are commensurate with production needs. Perform at least 2 calibration runs for each aggregate gate.

108
Individual aggregate delivery rate check-runs must not deviate more than 1.0 percent from the mathematical average of all runs for the same gate and aggregate type. Each test run must be at least 1,000 pounds.

109
At the time of batching, dry and drain aggregates to a stable moisture content. Do not proportion aggregates with visible separation of water from the aggregate during proportioning. At the time of batching, the free moisture content of fine aggregate must not exceed 8 percent of its saturated, surface-dry weight.

110
If the proportioning plant has separate supplies of the same size group of aggregate with different moisture content, specific gravity, or surface characteristics affecting workability, exhaust 1 supply before using another supply.
Cover rotating and reciprocating equipment on batch-mixer trucks with metal guards.

Individual cement delivery rate check-runs must not deviate more than 1.0 percent of the mathematical average of 3 runs of at least 1,000 pounds each.

When the water meter operates from 50 to 100 percent of production capacity, the indicated weight of water delivered must not differ from the actual weight delivered by more than 1.5 percent for each of 2 runs of 300 gallons. Calibrate the water meter under California Test 109. The water meter must be equipped with a resettable totalizer and display the operating rate.

Conduct calibration tests for aggregate, cement, and water proportioning devices with a platform scale located at the calibration site. Platform scales for weighing test-run calibration material must have a maximum capacity of 2.75 tons with maximum graduations of 1 pound. Error test the platform scale within 8 hours of calibrating the batch-mixer truck proportioning devices. Perform error-testing with test weights under California Test 109. Furnish a witness scale that is within 2 graduations of the test weight load. The witness scale must be available for use at the production site throughout the production period. Equipment needed for the calibration of proportioning systems must remain available at the production site throughout the production period.

The batch-mixer truck must be equipped so that accuracy checks can be made. Recalibrate proportioning devices every 30 days after production starts or when you change the source or type of any ingredient.

A spot calibration is calibration of the cement proportioning system only. Perform a 2-run spot calibration each time 55 tons of cement passes through the batch-mixer truck. If the spot calibration shows the cement proportioning system does not comply with the specifications, complete a full calibration of the cement proportioning system before you resume production.

Proportion liquid admixtures with a meter.

Locate cement storage immediately before the cement feeder. Equip the system with a device that automatically shuts down power to the cement feeder and aggregate belt feeder when the cement storage level is less than 20 percent of the total volume.

Submit aggregate moisture determinations, made under California Test 223, at least every 2 hours during proportioning and mixing operations. Record moisture determinations and submit them at the end of each production shift.
120
Equip each aggregate bin with a device that automatically shuts down the power to the cement feeder and the aggregate belt feeder when the aggregate discharge rate is less than 95 percent of the scheduled discharge rate.

121
Proportioning device indicators must be in working order before starting proportioning and mixing operations and must be visible when standing near the batch-mixer truck.

122
Identifying numbers of batch-mixer trucks must be at least 3 inches in height, and be located on the front and rear of the vehicles.

123
Mix volumetric proportioned RSC in a mechanically operated mixer. You may use auger-type mixers. Operate mixers uniformly at the mixing speed recommended by the manufacturer. Do not use mixers that have an accumulation of hard concrete or mortar.

124
Do not mix more material than will permit complete mixing. Reduce the volume of material in the mixer if complete mixing is not achieved. Continue mixing until a homogeneous mixture is produced at discharge. Do not add water to the RSC after discharge.

125
Do not use equipment with components made of aluminum or magnesium alloys that may have contact with plastic concrete during mixing or transporting of RSC.

126
The Engineer determines uniformity of concrete mixtures by differences in penetration measurements made under California Test 533. Differences in penetration are determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load. The differences must not exceed 5/8 inch. Submit samples of freshly mixed concrete. Sampling facilities must be safe, accessible, clean, and produce a sample that is representative of production. Sampling devices and sampling methods must comply with California Test 125.

127
Do not use ice to cool RSC directly. If ice is used to cool water used in the mix, it must be melted before entering the mixer.

128
When proportioning and charging cement into the mixer, prevent variance of the required quantity by conditions such as wind or accumulation on equipment.

129
Each mixer must have metal plates that provide the following information:

1. Designed usage
2. Manufacturer's guaranteed mixed concrete volumetric capacity
3. Rotation speed
130

The device controlling the proportioning of cement, aggregate, and water must produce production data. The production data must be captured at 15-minute intervals throughout daily production. Each capture of production data represents production activity at that time and is not a summation of data. The amount of material represented by each production capture is the amount produced in the period from 7.5 minutes before to 7.5 minutes after the capture time. The daily production data must be submitted in electronic or printed media at the end of each production shift. The reported data must be in the order including data titles as follows:

1. Weight of cement per revolution count
2. Weight of each aggregate size per revolution count
3. Gate openings for each used aggregate size
4. Weight of water added to the concrete per revolution count
5. Moisture content of each used aggregate size
6. Individual volume of other admixtures per revolution count
7. Time of day
8. Day of week
9. Production start and stop times
10. Batch-mixer truck identification
11. Name of supplier
12. Specific type of concrete being produced
13. Source of the individual aggregate sizes
14. Source, brand, and type of cement
15. Source, brand and type of individual admixtures
16. Name and signature of operator

131

You may input production data by hand into a pre-printed form or it may be 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.

Delete paragraphs 132 to 136 if aggregate base is used underneath the JPCP (RSC)

Bond Breaker

132 Edit as needed to describe the underlying base layer

Place bond breaker between JPCP (RSC) and ________________ layer.

133

If you use curing paper or polyethylene film, place it in a wrinkle free manner. Overlap adjacent sheets a minimum of 6 inches in the same direction as the concrete pour.

134

If you use curing compound or paving asphalt, before application remove foreign and loose materials remaining from slab removal.
135

If you use paving asphalt, do not add water before applying asphalt to the base surface. Apply the paving asphalt in one even application at a rate from 0.02 to 0.10 gallon per square yard over the entire base surface area. Do not place concrete pavement until the paving asphalt has cured.

136

If you use curing compound, apply it in 2 separate applications. Apply each application evenly at a rate from 0.07 to 0.11 gallon per square yard over the entire base surface area.

Spreading, Compacting, and Shaping

137

You may use metal or wood side forms. Wood side forms must not be less than 1-1/2 inches thick. Side forms must be of sufficient rigidity, both in the form and in the connection with adjoining forms, that movement will not occur under forces from subgrading and paving equipment or from the pressure of concrete.

138

Side forms must remain in place until the pavement edge no longer requires the protection of forms. Clean and oil side forms before each use.

139

After you deposit the RSC on the subgrade, consolidate RSC with high-frequency internal vibrators. Consolidate adjacent to forms and across the full paving width. Place RSC as nearly as possible to its final position. Do not use vibrators for extensive shifting of RSC.

140

Spread and shape RSC with powered finishing machines supplemented by hand finishing.

141

After you mix and place RSC, do not add water to the surface to facilitate finishing. Use surface finishing additives as recommended by the manufacturer of the cement after their use is approved by the Engineer.

Joints

142

Before placing RSC against existing concrete, place 1/4-inch thick commercial quality polyethylene flexible foam expansion joint filler across the original transverse and longitudinal joint faces and extend the excavation's full depth. Place the top of the joint filler flush with the top of the pavement. Secure joint filler to the joint face of the existing pavement to prevent the joint filler from moving during the placement of RSC.

Final Finishing

143

If the Engineer determines by visual inspection the final texturing may not comply with the specifications for coefficient of friction, the Engineer tests to determine coefficient of friction.
Open the pavement to traffic and allow 5 days after concrete placement for the Department to test for coefficient of friction. If pavement does not comply with the specifications for coefficient of friction, grind the pavement under Section 42-2, "Grinding," of the Standard Specifications. Perform grinding before sealing joints.

143A. Use only for ramp termini, otherwise delete

On ramp termini, use heavy brooming normal to the ramp centerline to produce a coefficient of friction of at least 0.35 determined on the hardened surface under California Test 342.

Curing Method

144

Use the curing method recommended by the manufacturer of the cement for JPCP (RSC).

Concrete Pavement Removal

145

When removing and replacing concrete, remove it to full depth and width.

Crack Treatment

146. Add SSP 40-250 if using this paragraph. Otherwise delete and delete heading.

If cracks form that do not extend to the full depth of a slab, treat the cracks with a high molecular weight methacrylate resin under "Concrete Pavement Crack Treatment."

Removal and Replacement of Slabs Without Bar Reinforcement

147

For full depth and partial length slab removal, saw cut the full depth and width.

148

Saw cut full slabs at the longitudinal and transverse joints. Saw cut partial slabs at joints and where the Engineer orders. You may make additional saw cuts within the removal area to facilitate slab removal or to prevent binding of the saw cut at the removal area's edge. Saw cut perpendicular to the slab surface.

149

Use slab lifting equipment with lifting devices that attach to the slab. After lifting the slab, paint the cut ends of dowels and tie bars.

150

Construct transverse and longitudinal construction joints between the new slab and existing concrete using dowel bars. For longitudinal joints, offset dowel bar holes from original tie bars by 3 inches. For transverse joints, offset dowel bars holes from the original dowel bars by 3 inches.

151

Drill holes and use chemical adhesive to bond the dowel bars to the existing concrete. Use an automated dowel bar drilling machine. Holes must be at least 1/8-inch greater than the dowel
bar diameter. Clean the holes in compliance with the chemical adhesive manufacturer's instructions. Holes must be dry when you place chemical adhesive.

152

Immediately after inserting dowel bars into the chemical adhesive-filled holes, support the dowel bars and leave them undisturbed for the minimum cure time recommended by the chemical adhesive manufacturer.

153

Clean the faces of joints and underlying base from loose material and contaminants. Coat the faces with a double application of pigmented curing compound under Section 28-1.07, "Curing," of the Standard Specifications. For partial slab replacements, place preformed sponge rubber expansion joint filler at new transverse joints in compliance with ASTM D1752.

MEASUREMENT AND PAYMENT

Paras 154 through 156: Edit to include “jointed plain concrete pavement (ramp termini with rapid strength concrete)” if pay item is included in the project.

154 Delete if paragraphs 28 through 38 are deleted.

If the Engineer accepts a test strip and it remains as part of the paving surface, the test strip is measured and paid for as jointed plain concrete pavement (rapid strength concrete), seal pavement joint, and seal isolation joint as the case may be.

155

The contract price paid per cubic yard for jointed plain concrete pavement (rapid strength concrete) as designated in the Verified Bid Item List includes full compensation for furnishing all labor, materials, tools, equipment, and incidental expenses, and for doing all the work involved in constructing the concrete pavement, complete in place including bond breaker, bar reinforcement, tie bars, dowel bars, anchors, and fasteners, as shown on the plans and as specified in these specifications and the special provisions, and as directed by the Engineer.

155A If the quantity of JPCP (RSC) is < 300 cubic yards, delete “the quality control program, constructing test strips,”. If paragraphs 39 and 40 are used in lieu of paragraphs 28 through 38, edit to say “trial slab” instead of “test strips”.

Full compensation for the quality control program, constructing test strips, furnishing and disposing of standby materials for temporary roadway pavement structure, constructing, maintaining, removing, and disposing of temporary roadway pavement structure, and work involved in determining the modulus of rupture of RSC are included in the contract price paid per cubic yard for jointed plain concrete pavement (rapid strength concrete) and no additional compensation will be allowed therefor.

156

The Engineer adjusts payment for jointed plain concrete pavement (rapid strength concrete) in compliance with "Pay Factor Adjustment for Low Modulus of Rupture."

157

Repair, or removal and replacement of damaged pavement and base is at your expense and will not be measured or paid for.
158. Use paragraphs 158 and 159 if transition panels to asphalt concrete (Standard Plan P30) using rapid strength concrete are specified.

The contract item for concrete pavement transition panel as designated in the Verified Bid Item List is measured by the cubic yard. The Engineer calculates the pay quantity volume based on the plan dimensions. The Engineer does not measure concrete pavement placed outside those dimensions unless it was ordered by the Engineer.

159

The contract price paid per cubic yard for concrete pavement transition panel as designated in the Verified Bid Item List includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the concrete pavement, complete in place including bar reinforcement, tie bars, and dowel bars as shown on the plans and as specified in these specifications and the special provisions, and as directed by the Engineer.

160

Full compensation for providing a facility for and attending the prepping conference is included in the contract price paid per cubic yard for jointed plain concrete pavement (rapid strength concrete) and no additional compensation is allowed therefor.

161

Full compensation for applying tack coat at transverse transition joints and end anchors is included in the contract price paid per cubic yard for jointed plain concrete pavement (rapid strength concrete) and no separate payment is made therefor.

162

If the curvature of a slab affects tie bar spacing and additional tie bars are required, they are included in the contract price paid per cubic yard for jointed plain concrete pavement (rapid strength concrete) and no additional compensation is allowed therefor.

163. Use if volumetric proportioning is allowed on the project.

If calibration of volumetric batch-trucks is performed more than 100 miles from the project limits, payment for individual slab replacement is reduced by $1,000 per calibration session.
5. MODIFY COMMUNICATION SYSTEM TRANSPORTATION MANAGEMENT CENTER (TMC)

10-3.06 MODIFY COMMUNICATION SYSTEM TRANSPORTATION MANAGEMENT CENTER (TMC)

DESCRIPTION
Modify communication system (TMC) shall consist of:
1. Removing existing equipment and installing new equipment in the existing TMC.
2. Installing fiber optic jumpers and cables of various types.
3. Installing the following equipment into the existing 19” racks as per the plans and these special provisions:

<table>
<thead>
<tr>
<th>Qt</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Port Server</td>
</tr>
<tr>
<td>XX</td>
<td>Video Demultiplexer</td>
</tr>
<tr>
<td>XX</td>
<td>Video Distribution Amplifier</td>
</tr>
<tr>
<td>XX</td>
<td>Video Encoder</td>
</tr>
<tr>
<td>XX</td>
<td>Multiple Outlet Power Strip</td>
</tr>
<tr>
<td>XX</td>
<td>Counter Port Server</td>
</tr>
<tr>
<td>XX</td>
<td>Fiber Optic Jumper</td>
</tr>
<tr>
<td>XX</td>
<td>Coaxial Cable</td>
</tr>
<tr>
<td>XX</td>
<td>CAT 5E Cable</td>
</tr>
<tr>
<td>XX</td>
<td>RS-232 Cable</td>
</tr>
</tbody>
</table>

WARRANTY
All equipment shall be warranted against defects and any failure, which may occur through normal use for a minimum of three (3) years from the date of contract acceptance.

The distribution interconnect package, fiber optic cable assemblies and pigtails are described elsewhere in these special provisions.

VIDEO ENCODER

GENERAL
Summary
The Video Encoder shall provide video inputs for each of the video DEMUX unit’s outputs. Each shall have serial RS485 output for Pan Tilt Zoom (PTZ) control and a gigabit Ethernet output for encoded video. The unit shall mount in a standard 19” rack and provide up to 18 inputs per 1U chassis.
MINIMUM SPECIFICATIONS (VIDEO ENCODER)

1. Video Compression: H.264 (MPEG-4 Part 10/VAC) and Motion JPEG
2. Resolutions: 176x120 to 720x576
3. Frame Rate: 30/25 (NTSC/PAL) fps in all resolutions
4. Video Streaming: Multi-Stream H.264 and Motion JPEG: 3 simultaneous, individually configured streams in max. resolution at 30/25 fps; more streams if identical or limited in frame rate/resolution, Controllable frame rate and bandwidth
5. Image Settings: Compression, color, brightness, contrast
   Rotation: 90°, 180°, 270°
   Aspect ratio correction
   Mirroring of images
   Text and image overlay
   Privacy mask
   Enhanced deinterface filter
6. Pan/Tilt/Zoom: Wide range of analog PTZ cameras and supported 100 presets/camera, guard tour, PTZ control queue
7. Security (Network): Password protection, IP address filtering, HTTPS encryption, IEEE 802.1X network access control, digest authentication, user access log
8. Supported Network Protocols: Ipv4/v6, HTTP, HTTPS, Qos layer 3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS
9. Intelligent Video: Video motion detection, active tampering alarm
10. Alarm Triggers: Intelligent video, external inputs, video loss
11. Alarm Events: File upload via FTP, HTTP and email
    Notification via email, HTTP and TCP
    PTZ preset
    External output activation
12. Video Buffer: 64 NB pre- and post-alarm
13. Connectors: 6 analog composite video BNC input, NTSC/PAL auto-
   Sensing, 1000BaseT Ethernet
   Terminal block for up to 12 configurable external inputs/outputs and up to 6 RS-485 half duplex, depending on the rack cabinet
14. Operating Conditions: 0-45 °C (32-113 °F) Humidity 20-80% RH (non-condensing)
15. Approvals: EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-6-1, EN 61000-6-2, FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, C-trick AS/NZS CISPR 22, EN 60950-1
MINIMUM SPECIFICATIONS (RACK CABINET)

1. Expansion Slots: 3 slots for video encoder cards
2. Casing: Metal casing for standalone or rack mounting
3. Power: 100-240 V AC
4. Connectors: Ethernet 10BASE-T/100BASE-TX/1000BASE-T
   RJ-45 (Gigabit Ethernet)
   3 terminal blocks
   4 alarm inputs
   4 outputs
   RS-485/422 half-duplex
5. Approvals: EN 55022 Class B, EN 61000-3-2, EN 61000-3-3,
   EN 55024, EN 61000-3-2, FCC Part 15 Subpart B Class B, VCCI Class B, AS/NZ CISPR 22,
   ICES-003, ITE, UL, cUL, EN 60950-1, CB-certificate, KTL

VIDEO DISTRIBUTION AMPLIFIER

GENERAL

Summary

The Video Distribution Amplifier shall distribute video inputs to at least three video outputs
for each input.

MINIMUM SPECIFICATIONS

1. Number of Inputs: 8 independent channels 1Vpp/75Ω on BNC connectors
2. Output: 3 independent channels (1 Vpp/75 Ω on BNC connectors) per input
3. Max. Output Level: 3.3 Vpp
4. Bandwidth (-3db): 500 MHz
5. Diff. Gain: 0.03%
6. Diff. Phase: 0.03 Deg
7. K-Factor: <0.05%
8. S/N Ratio: 70dB
9. Crosstalk (all hostile): -53dB
10. Controls: EQ: 0 to 11dB @ 50 MHz
11. Coupling: DC Power
12. Source: 100-240 VAC, 50/60Hz, 7VA
13. Dimensions: 19” x 7” x 1UW, D, H, rack mountable
14. Weight: 2.5kg (5.5lbs) approx.
15. Accessories: Power cord, rack “ears”
COUNTER PORT SERVER

GENERAL

The Counter Port Server shall be compatible with the existing Port Server Digi Port Server TS1 and shall provide RS-232/422/485 serial-to-Ethernet connectivity. The port server shall meet the following requirements:

PHYSICAL CHARACTERISTICS:
1. Weight: Less than 70 grams
2. Size: 5.25 in (wide) x 3.33 in (high) x 0.95 in (long).
3. Status LEDs (Link, Power)

ENVIRONMENTAL:
1. Operating Temperature Ranges: From 0°C to +55°C (32°F to 130° F)
2. Humidity: From 5 percent to 95 percent non-condensing.

POWER REQUIREMENTS:
1. Input power: 100-250VAC, 50/60 Hz
2. Power Consumption: 12 W

APPLICATION INTERFACES:

a. Serial:
   - Ports: 1
   - Throughput: Up to 230 Kbps
   - Signal Support: TXD, RXD, RTS, CTS, DTR, DSR and DCD
b. Ethernet:
   - Physical Layer: 10/100Base-T
   - Data Rate: 10/100 Mbps
   - Mode: Full or Half duplex

APPLICATION SUPPORT
1. HTTP/HTTPS, CLI, Port Authority-Remote management diagnostics and auto- discovery tool
2. Protocols supported: UDP/TCP, DHCP/RARP/ARP-Ping for IP Address assignment, PPP (PAP & CHAP), Extended Telnet RFC 2217, Telnet, Reverse Telnet, R-login, Auto- connect

SAFETY
UL60950; CAN/CSA C22.2 No. 60950; EN60950 Emissions / Immunity: FCC Part 15, Subpart B, Class A; EN55022, Class A; EN55024; EN61000-3-2
CERTIFICATE OF COMPLIANCE

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with NEMA TS1/2 Environmental Requirements for Traffic Control Equipment.

MULTIPLE OUTLET POWER STRIP

GENERAL

Summary

A Multiple Outlet Power Strip shall be furnished and installed in the existing racks as shown on the plans.

MINIMUM SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting</td>
<td>19” rack mount</td>
</tr>
<tr>
<td>No. of outlets</td>
<td>6 or greater</td>
</tr>
<tr>
<td>Electrical Rating</td>
<td>15 A, 125 VAC, 60 Hz</td>
</tr>
<tr>
<td>Circuit Breaker</td>
<td>12 A, 125 VAC</td>
</tr>
<tr>
<td>Max. Surge Current</td>
<td>&gt;6500 A</td>
</tr>
<tr>
<td>Max. Energy Dissipation</td>
<td>&gt;210 J</td>
</tr>
<tr>
<td>Modes of Surge Protection</td>
<td>Hot-to-Neutral</td>
</tr>
<tr>
<td>Clamping Response Time</td>
<td>&lt;Less than one nanosecond</td>
</tr>
<tr>
<td>Modes of Noise Protection</td>
<td>Transverse and Common</td>
</tr>
<tr>
<td>Noise Attenuation</td>
<td>20 to 40 dB</td>
</tr>
<tr>
<td>Noise Frequency Range</td>
<td>150 kHz - 100 MHz</td>
</tr>
<tr>
<td>Type of Cordset</td>
<td>SJT 14/3</td>
</tr>
</tbody>
</table>

VIDEO DEMULTIPLEXER

GENERAL

The demultiplexer shall be capable of providing optical reception (demultiplexing) of up to 16 channels of RS-250C baseband video via 8-bit linear pulse code modulation digital-decoding, from the communications hub to the demultiplexer unit located within the Transportation Management Center.

All equipment shall have an ambient operating temperature range of 0 to +60°C, and shall be directly mountable within the existing IFS Model R3 19-Inch Card Cage Unit.

The video demultiplexer unit shall not utilize video compression techniques and shall introduce zero latency to each of the 16 received video channels, and shall not require any user-adjustments to facilitate installation or operation.

Operating Wavelength: 1300 nm, single mode
Optical Detector: PIN Photodiode
Optical Connector Type: Type SC  
Operating Power: 115 V(ac)

LED status indicators shall be provided on the video demultiplexer unit for ascertaining the status of the following parameters:
A. Video sync presence for each video output channel  
B. Optical Carrier Detect/Link-Lock  
C. Operating Power

The 16-channel video multiplexer and demultiplexer units shall provide the following video transmission performance end-to-end with an optical path loss of 18 dB between the two units:
A. Video Signal-to-Noise Ratio: 60 dB, at a maximum optical path loss of 18 dB.  
B. Video Bandwidth: 5 Hz. to 6.5 MHz.  
C. Differential Gain: <2 percent.  
D. Differential Phase: <0.7 degrees.  
E. Tilt: <1 percent.

Installation  
The video demultiplexer system shall be installed at the TMC as shown on plans and specified in these special provisions. The Contractor shall:
A. Connect the correct optical pigtail or patch cord to the optical connector on the transmitters and receivers, as well as the correct video interface cables to the demodulator inputs and demodulator outputs as specified by the equipment manufacturer.  
B. Coordinate the physical space required by the Video demodulator with the space allocated with any other equipment.  
C. Connect the video demodulator power supply to one of the 120 V(ac), 60 Hz power receptacles reserved for communication equipment in the TMC. The fiber optic path for each video link shall be tested and verified in accordance with the contract prior to installing the video demodulator.  
D. Neatly install all drop cables together, route them along the same path and neatly secure them to the support rails in the equipment racks. No cable shall be installed with a bend radius less than the manufacture’s minimum recommended bending radius.
6. MODIFY FIBER OPTIC COMMUNICATION SYSTEM

10-3.27 MODIFY FIBER OPTIC COMMUNICATION SYSTEM

GENERAL

**SUMMARY**

Modify fiber optic communication system. This work includes furnishing and installing the following equipment and performing testing as per as shown on the plans, in conformance with the these special provisions and Section 86 "Signals, Lighting and Electrical Systems" of the Standard Specifications:

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Optic Conduit</td>
</tr>
<tr>
<td>Innerduct</td>
</tr>
<tr>
<td>Fiber Optic Splice Vault</td>
</tr>
<tr>
<td>Tracer Wire</td>
</tr>
<tr>
<td>Fiber Optic Trench Delineators</td>
</tr>
<tr>
<td>Underground Warning Tape</td>
</tr>
<tr>
<td>Sealing Plugs</td>
</tr>
<tr>
<td>Fiber Optic Labeling</td>
</tr>
<tr>
<td>Fiber Optic Outside Plant Cable</td>
</tr>
<tr>
<td>Fiber Optic Cable Splices</td>
</tr>
<tr>
<td>Fiber Optic Splice Closure</td>
</tr>
<tr>
<td>Fiber Optic Splice Trays</td>
</tr>
<tr>
<td>Distribution Interconnect Package</td>
</tr>
<tr>
<td>Fiber Optic Jumpers and Pigtails</td>
</tr>
<tr>
<td>Connectors</td>
</tr>
<tr>
<td>Couplers</td>
</tr>
<tr>
<td>Interconnect and Termination Unit</td>
</tr>
<tr>
<td>Fiber Distribution Unit</td>
</tr>
<tr>
<td>Network to Serial Adapter Card</td>
</tr>
<tr>
<td>Category 5E Cable</td>
</tr>
<tr>
<td>Element Fiber Optic Switch</td>
</tr>
<tr>
<td>LAN Extender</td>
</tr>
<tr>
<td>Ethernet Switch</td>
</tr>
<tr>
<td>Ethernet to Serial Converter</td>
</tr>
<tr>
<td>TOS Fiber Optic Switch</td>
</tr>
<tr>
<td>Fiber optic Testing</td>
</tr>
<tr>
<td>System Testing and Documentation</td>
</tr>
</tbody>
</table>

EDIT AS NECESSARY, DOES NOT CONTAIN ALL ITEMS**********
2. DEFINITIONS

Breakout: The cable "breakout" is produced by (1) removing the jacket just beyond the last tie-wrap point, (2) exposing one 3 to 2-m 6 feet of the cable buffers, aramid strength yarn and central fiberglass strength member, and (3) cutting the aramid yarn, central strength member and the buffer tubes to expose the individual glass fibers for splicing or connection to the appropriate device.

Connector: A mechanical device used to provide a means for attaching to and decoupling from a transmitter, receiver, or another fiber (such as on a patch panel).

Connectorized: The termination point of a fiber after connectors have been affixed.

Connector Module Housing (CMH): A patch panel used to terminate singlemode or multimode fibers with most common connector types. It may include a jumper storage shelf and a hinged door.

Couplers: Couplers are devices which mate two fiber optic connectors to facilitate the transition of optical light signals from one connector into another. Couplers are also referred to as: adapters, feed-throughs, and barrels. They are normally located within FDFs and ITUs mounted in panels. They may also be used unmounted, to join two simplex fiber runs.

Fiber Distribution Frame (FDF): A rack mounted system that is usually installed in the TMC and the HUB location, that consists of a standard equipment rack, fiber routing guides, horizontal jumper troughs, fiber distribution units (FDU), connector module housings (CMH), and splice module housings (SMH).

Fiber Distribution Unit (FDU): An enclosure or rack mountable unit containing both a Connector Module Housing (CMH) and a Splice Module Housing (SMH) enclosure. The units CMH and SMH may be integrated by a partition.

Interconnect/Termination Unit (ITU): A patch panel used to terminate fibers with most common connector types. It may include a jumper storage shelf and a hinge door.

Jumper: A short fiber optic cable that has connectors installed on both ends, and is used for connection within a FDU.

Launch Cable: A cable used to aid in the testing of fiber optic cables when using an OTDR. This cable helps to minimize the effects of the OTDR's launch pulse on measurement uncertainty.

Light Source: A portable transportable piece of fiber optic test equipment that, in conjunction when coupled with a power meter, is used to perform end-to-end attenuation testing. It contains a stabilized light source operating at the designed wavelength of the system under test. It also couples light from the source into the fiber to be received at the far end by the receiver.

Link: A passive section of the system, the ends of which are connectorized to be connected to active components. A link may include splices and couplers. For example, a video data link may be from a F/O transmitter to a video multiplexer (MUX).
**Optical Time Domain Reflectometer (ODTR):** A piece of fiber optic test equipment similar in appearance to an oscilloscope that is used to measure the total amount of power loss between two points. It provides a visual and printed display of the relative location of system components such as fiber sections, splices and connectors as well as the losses that are attributed to each component or defects in the fiber.

**Patchcord:** A short jumper used to join two Connector Module Housing (CMH) couplers, and or a CMH and an active optical electronic device.

**Pigtails:** Relatively short length of fiber optic cable that is connectorized on only one end. All pigtails shall be tight buffer cable.

**Power Meter:** A portable transportable piece of fiber optic test equipment that, when coupled with a light source, is used to perform end-to-end attenuation testing. It contains a detector that is sensitive to light at the designed wavelength of the system under test. Its display indicates the amount of power injected by the light source that arrives at the receiving end of the link.

**Ping:** For testing purposes, a "ping" is defined as: a computer network administration utility used to test whether a particular host is reachable across an internet protocol (IP) network. The IP addressable equipment shall be "pinged" a minimum of 5 consecutive instances for each test.

**Riser Cable:** NEC approved cable installed in a riser (a vertical shaft in a building connecting one floor to another).

**Segment:** A section of F/O cable that is not connected to any active device and may or may not have splices per the design.

**Splice:** The permanent joining of fiber ends to identical or similar fibers.

**Splice Closure:** A container used to organize and protect splice trays. The container allows splitting or routing of fiber cables from multiple locations. The container is environmentally sealed to protect the fibers.

**Splice Module Housing (SMH):** The SMH stores splice trays as well as pigtails and short cable lengths.

**Splice Tray:** A container used to organize and protect spliced fibers.

**Storage Cabinet:** Designed for holding excess cable slack for protection. The storage cabinet allows the user flexibility in equipment location and the ability to pull cable back for resplicing.

3.

**Glossary**

**F/O:** Fiber optic.

**FOC:** Fiber optic cable.

**FOIP:** Fiber optic inside plant cable.

**FOP:** Fiber optic outside plant cable.

**FOTP:** Fiber optic test procedure(s) as defined by EIA/TIA standards.
4. FIBER OPTIC CONDUIT

Fiber optic conduit is defined as conduit that will contain innerduct or fiber optic cable, as shown on the plans. Furnishing and installing fiber optic conduit shall conform to the provision of section "Conduit" of these special provisions and these special provisions the following.

5.

All fiber optic conduits to be installed underground shall be either Type 1, Type 3 Schedule 80, or Type 5, except as specified herein, and that the conduit between the vaults at approximate Stations XX+XX and XX+XX shall be Type 3.

6. Type 1 or Type 5 conduit shall be used in bridges.

7. Type 2 conduit shall be used from the bridge to the first pull box or splice vault.

8. Type 1 or Type 5 conduit shall be used for fiber optic conduit bends, except when using conduit with integral innerduct. Minimum conduit bend radius shall be 10 times trade diameter of the conduit.

9. Direct coupling of Type 1 or Type 5 to Type 3 fiber optic conduit will be permitted at underground locations by means of an industry standard rigid non-metallic conduit coupling. The coupling shall be the type for joining threaded conduit to solvent welded conduit.

10. When Type 3 Schedule 80 fiber optic conduit is placed in a trench that is not in a pavement area it shall conform to section 86-2.05C "Installation" of the Standard Specifications" except where the top 100 mm of fine soil or sand shall be 150 mm. the trench shall be backfilled with commercial quality colored concrete, as described elsewhere in these special provisions, containing not less than 250 kg of portland cement per cubic meter, to the dimensions shown on the plans. The trench shall be wide enough for a minimum of 25 mm of concrete between the wall of the trench and the side of the conduit. Other conduits in a shared trench shall be placed as shown on the plans.

11. Concrete used to backfill trenches shall have a 24 hour curing period. The trenches shall have barricades with "Open Trench" signs posted at the beginning of the trench and every 60 meters thereafter.

12. Conduit trenches in or adjacent to paved shoulders shall be backfilled within 3 calendar days.
13. Conduit trenches in and across traffic lanes shall be backfilled during the same work period the trench is excavated except that the top 612" of asphalt shall be placed within 3 calendar days.

14. At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions" of these special provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

15. At locations where conduit is required to be installed under pavement and existing underground facilities require special precautions, as described in "Obstructions" of these special provisions, conduit shall be placed by the "Trenching in Pavement Method" as specified in Section 86-2.05C, except conduit shall be as specified above.

16. All jacked conduit shall be Type 1 or Type 5. No trenching shall be allowed across freeway and ramps.

17. Immediately prior to installing cables and/or innerduct, conduit shall be blown out with compressed air until all foreign material is removed.

18. After fiber optic cables and/or innerduct have been installed, the ends of conduits and innerduct shall be sealed with an approved type of conduit sealing plug.

19. Use only when 4" fiber conduit is crossing local street

   At locations when 4" fiber optic conduit has to cross local or State streets the conduit shall be install in a 10" steel sleeve.

EDIT AS NECESSARY AND USE IF NEEDED

20. Split Conduit

   Use when relocating fiber optic splice vaults and do not wish to cut and splice the existing fiber optic cables, otherwise delete

   The split conduit shall conform with RA the provisions under "Fiber Optic Conduit" of these special provisions. It shall have an interlocking design which allows sections to be staggered and butted together. Joints shall be sealed with tape as per manufacturer's instructions and the assembled section shall be reinforced with steel hose clamps at 1' intervals.
21. INNERDUCT

Innerduct shall be installed wherever fiber optic cable is installed in conduit, except conduit housing Type D fiber optic cable. Wherever 4 inch conduit is required, four Size 3/4 inch innerducts shall be installed unless otherwise specified.

22. Copper cable shall not be mixed with F/O cable within the same innerduct.

23. Innerduct consists of an extruded flexible annealed polyethylene tubing that is installed inside conduit, and which in turn the fiber optic cable is installed. Innerduct within a conduit run shall be continuous without splices or joints. Innerduct for this project shall be continuous longitudinally ribbed inside and outside.

24. Unless otherwise shown on the plans, innerduct for this project shall be nominal 43/4 inch inside diameter, with wall thickness of 2300 µm ± 8076 µm, (0.0906 inch ± 0.003 inch), and shall meet the following requirements:

24a. Polyethylene for innerduct shall have a density of 0.955 ± 0.005 gm/cm³ (ASTM Standard D-1505), and shall conform to the applicable portions of ASTM Designations: D 3485, D 3035, D 2239, and D 2447, and the applicable portions of NEMA TC7 and TC2. Tensile yield strength shall be a minimum of 23 Mpa 22753 kPa, (ASTM D 638).

24b. Different innerducts within the same conduits shall be different colors and the colors chosen shall be consistent with the required cables throughout the project. See the table below:
<table>
<thead>
<tr>
<th>Color</th>
<th>Fiber optic cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Type A (24)</td>
</tr>
<tr>
<td>Orange</td>
<td>Type B (60)</td>
</tr>
<tr>
<td>Yellow</td>
<td>Type C (48)</td>
</tr>
<tr>
<td>White</td>
<td>Empty</td>
</tr>
</tbody>
</table>

25. **RA**

Pull tapes for future use shall be installed in the empty orange and white innerducts.

26.

The innerduct shall be shipped on reels marked with the manufacturer, the contract number, and the size and length of the innerduct. The product on reels shall be covered with aluminized material to protect colors from UV deterioration during shipment and storage.

27.

Immediately prior to installing innerducts, all conduits shall be blown out with compressed air until all foreign material is removed. After cables, conductors or innerduct have been installed, the ends of innerducts shall be sealed with an approved type of sealing plugs.

28.

A manufacturer recommended lubricant shall be applied between the innerducts and the conduit during installation to reduce friction.

29. **RA**

Installation procedures shall conform to the procedures specified by the innerduct manufacturer. If the innerduct is installed using mechanical assistance, a dynamometer shall be used to record installation tension and a tension limiting device shall be used to prevent exceeding the maximum pulling tension during installation. The tension shall be set to the manufacturer's maximum limit. The maximum pulling tension shall be recorded for each innerduct run. The innerduct shall not be stressed beyond the maximum bending radius allowed by either the innerduct or fiber optic cable manufacturer.

30. **RA**

Immediately prior to installing cables, innerduct shall be blown out with compressed air until all foreign material is removed. After cables have been installed, the ends of innerducts shall be sealed with an approved type of rubber conduit plug.

31.

Each innerduct shall be one continuous unit within a conduit run.
32. Split Wall Innerduct

Use when relocating fiber optic splice vaults and do not wish to cut and splice the existing fiber optic cables, otherwise delete

RA ISdR***

The split wall innerduct shall conform to the provisions under "Innerduct" of these special provisions. Innerduct shall be installed wherever F/O cable is installed in conduit. Four Split wall innerducts (hereafter written as "innerduct") shall be installed in the 4 inch fiber optic conduit as shown on the plans. The fourth innerduct shall be the non-slit wall type. Each fiber optic cable shall be installed in its own innerduct. Copper cable shall not be mixed with F/O cable within the same innerduct.

33. FIBER OPTIC SPLICE VAULT

Fiber optic splice vaults shall conform to the Western Underground Committee Guide No. 3.6 "Nonconcrete Enclosures," except where differences are noted here, and the details on the plans. Fiber optic splice vaults shall have minimum inside clearance of 914 mm 3 feet (W) x 1520 mm 5 feet (L) x 1520 mm 5 feet (D).

34. Covers shall be 2 piece torsion assisted sections. Cover marking shall be "CALTRANS FIBER OPTICS" on each cover section.

35. Each cover section shall have inset lifting pull slots.

36. Cover hold down bolts or cap screws and nuts shall be of brass, stainless steel, or other non-corroding metal material.

37. Covers shall be hot dipped galvanized steel.

38. Fiber optic splice vaults and covers shall be rated for AASHTO HS 20-44 loads and installed as detailed and where shown on the plans.

39. A concrete encasement ring shall be poured around the splice vault as shown on the plans. Concrete placed around and under traffic splice vaults as shown on the plans shall contain a minimum of 325 kg 20.3 lbs of portland cement per cubic foot.
40. Hangers shall be made of a non-corroding material and be free of any sharp edges. A separate hanger shall be provided for each type of fiber optic cable and be securely fastened to the side wall with the slack fiber optic cable neatly coiled in a figure-eight configuration.

41. A minimum of two "U shaped" knockouts are required on each side of the vault and shall be configured to allow for future removal of the vault without disturbing the existing conduits.

42. Use on all District 8 projects instead of a rectangular splice vault, where a splice vault is needed in a paved AC shoulder only.

**Fiber Optic Splice Vault-Round**

Fiber optic splice vaults shall conform to the Western Underground Committee Guide No. 3.6, "Nonconcrete Enclosures," except where differences are noted here or detailed on the plans. Dimensions of round traffic fiber optic splice vaults shall be as shown on the plans.

43. Fiber optic splice vault covers shall be rated for AASHTO HS 20-44 loading and shall be installed at the locations and in the manner shown on the plans. Concrete place around and under traffic splice vaults shall be minor concrete and shall contain not less than 325 kg 20.3 lbs of portland cement per cubic meter-foot.

44. Hangers shall be made of a non-corroding material and be free of any sharp edges. A separate hanger shall be provided for each type of fiber optic cable and be securely fastened to the side wall of the vault allowing the slack fiber optic cable to be neatly coiled in a circular configuration.

45. Pulling eyes shall be installed as necessary to accommodate pulling of cables.

46. **RA**

Tops of fiber optic vaults shall be installed at grade in paved areas and 25 mm 1" above grade in unpaved areas.

47. **RA**

The round fiber optic vaults shall be installed at grade level in paved areas, and shall be set at 1" above grade in unpaved areas.
48. To be used on all District 8 fiber optic projects with 4" conduits with fiber

TRACER WIRE

RA

Tracer wire shall be provided and placed in the trench over PVC conduits containing fiber optic cable and as shown in the plans. The wire shall be placed 2 inches above the uppermost conduit in the trench or secured to the top of the uppermost conduit in the trench.

49.

Tracer wire shall be provided and placed in 4" conduits containing fiber optic cable and as shown on the plans.

50. RA**

Tracer wire shall be a No. 12, minimum, solid copper conductor with Type TW, THW, RHW, or USE insulation. The tracer wire shall form a mechanically and electrically continuous line throughout the length of the trench. A minimum of 3' of slack shall be extended into each fiber optic pull box and splice vault from each direction.

51.

Tracer wires may be spliced at intervals of not less than 500'. Splices shall conform to Section 86-2.09, "Wiring," of the Standard Specifications.

52.
7. CLOSED CIRCUIT TELEVISION SYSTEMS

10-3.28 MODIFY CLOSED CIRCUIT TELEVISION SYSTEMS

GENERAL

SUMMARY

Modifications to Closed circuit television (CCTV) systems. This work includes furnishing and installing the following equipment: cabinet, camera assembly, CCTV pole and performing acceptance testing as per the plans, these special provisions and Section 86 “Signals, Lighting and Electrical Systems,” of the Standard Specifications:

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera Pole System</td>
</tr>
<tr>
<td>Cabinet Assembly</td>
</tr>
<tr>
<td>Camera Assembly</td>
</tr>
<tr>
<td>Camera Transceiver</td>
</tr>
<tr>
<td>Composite Cable</td>
</tr>
<tr>
<td>Acceptance Testing</td>
</tr>
</tbody>
</table>

2.

The closed circuit television (CCTV) system shall conform to all rules and regulations of the Federal Communications Commission.

3.

The CCTV system shall be installed as a complete and operational system.

4.

The Contractor shall be responsible for providing any mounting adapter and bracket required for installation of the CCTV system. All materials furnished, assembled, fabricated or installed under this item shall be new, corrosion resistant and in strict accordance with the details shown on the plans and in the specifications.

5.

CAMERA POLE SYSTEM

The camera pole sheet steel shall have a minimum yield of 48,000 psi (331 MPa). Modifications for hand hole, connector bracket and strain relief shall be made as shown on the plans.
6. The camera pole system shall include all necessary mounting hardware and wiring, foundation and anchor bolts and other equipment, as shown on the plans and specified in these special provisions.

7. CABINET ASSEMBLY
   Each cabinet assembly shall consist of the following:
   1. Cabinet Enclosure
   2. Power Distribution Assembly
   3. Interconnect and Termination Unit

8. Cabinet Enclosure
   Each cabinet enclosure shall be constructed as per Section 86-3.04A, "Cabinet Construction," of the Standard Specifications for aluminum material and a NEMA 4 type with dimensions as shown on the plan sheets. This enclosure shall house the CCTV equipment, housing and mounting cage as shown on the plans.

9. The enclosure and doors shall be fabricated of 0.125-inch minimum thickness aluminum. All exterior seams for enclosures and doors shall be continuously welded.

10. Exterior welds shall be ground smooth. Edges shall be filed to a radius of 0.03-inch, minimum.

11. Enclosures fabricated from aluminum sheet shall conform to the requirements in ASTM Designation: B209 or B209M for 5052-H32 aluminum sheet.

   A. Welding on aluminum enclosures shall be done by the gas metal arc welding (GMAW) process using bare aluminum welding electrodes. Electrodes shall conform to the requirements in American Welding Society (AWS) A5.10 for ER5356 aluminum alloy bare welding electrodes.

   B. Procedures, welders and welding operators for welding on aluminum shall be qualified in conformance with the requirements in AWS B3.0, "Welding Procedure and Performance Qualification," and to the practices recommended in AWS C5.6.

   C. The surfaces of each aluminum enclosure shall be finished to conform to the requirements in Military Specification MIL-A-8625C "Anodic Coatings for Aluminum and Aluminum Alloys" for a Type II, Class I coating, except that the anodic coating shall
have a minimum thickness of 0.0007-inch and a minimum coating weight of 0.001 ounce per square inch. The anodic coating shall be sealed in a 5 percent aqueous solution of nickel acetate (pH 5.0 to 6.5) for 15 minutes at 97°C. Prior to applying the anodic coating, the enclosures shall be cleaned and etched as follows:

1. Clean by immersion in inhibited alkaline cleaner such as Oakite 61A or Diversey 909, or equivalent, 6 ounces to 8 ounces per gallon, 71°C for 5 minutes.
2. Rinse in cold water.
3. Etch in a solution of 1/2 ounce of sodium fluoride, plus 4 ounces to 6 ounces of sodium hydroxide per gallon of distilled water at 60°C to 65°C for 5 minutes.
4. Rinse in cold water.
5. Desmut in a 50 percent by volume nitric acid solution at room temperature for 2 minutes.
6. Rinse in cold water.

12. The enclosure front door shall be equipped with a lock. When the door is closed and latched, the door shall be locked. The handle shall have provision for padlocking in the closed position. The handle shall have a minimum length of 7 inches and shall be provided with a 5/8-inch, minimum, steel shank. The handle shall be fabricated of cast aluminum or of zinc-plated or cadmium-plated steel. The enclosure door frame shall be designed so that the latching mechanism will hold tension on and form a firm seal between door gasketing and door frame. Enclosure locks shall be the solid brass, 6-pin tumbler rim type. The lock shall have rectangular, spring-loaded bolts. The locks shall be left hand, and rigidly mounted with stainless steel machine screws approximately 2 inches apart. Keys shall be removable in the locked and unlocked positions, and 2 keys furnished with each enclosure. The front position of the lock shall extend 1/8 inch to 3/8 inch beyond the outside surface of the door.

13. The latching mechanism shall be a 3-point enclosure latch with nylon rollers. The center catch and pushrods shall be zinc-plated or cadmium-plated steel. Pushrods shall be turned edgewise at the outer supports and shall be 1/4"x3/4", minimum. The nylon rollers shall have a minimum diameter of 3/4-inch and shall be equipped with ball bearings.

14. Hinges on enclosures may be aluminum with a stainless steel hinge pin. The hinges shall be bolted to the enclosure. The hinge pins and bolts shall not be accessible when the door is closed.

15. Gasketing shall be provided on all door openings and shall be dust tight. Gaskets shall be permanently bonded to the metal. The mating surface of the gasketing shall be covered with a silicone lubricant to prevent sticking to the mating surface.

16. Details of alternative designs shall be submitted for review and approval prior to the fabrication of the enclosures.
17. Substantial metal shelves or brackets shall be provided to support the batteries specified elsewhere.

18. Machine screws and bolts shall not protrude beyond the outside wall of the enclosure.

19. Conduit shall enter the enclosure at the rear unless shown otherwise on the plans.

20. The police panel is not required.

21. The cabinet enclosure shall include the housing and mounting cage as shown on the plans.

22. **Power Distribution Assembly**

The power distribution assembly shall consist of the following:

1. One 15 A, 120 V, single pole main breaker
2. Four standard 120 V receptacles
3. One duplex, 3 prong, NEMA Type 5-15R grounded utility type outlet
4. One multiple outlet strip with the following specifications:
   5. Protection Modes: All 3: H-N, H-G, N-G.
   6. High Frequency Noise Suppression: Up to 80 dB from 50 kHz to 1,000 MHz.
   7. High Voltage Transient Spike Suppression: Up to 36,000 A spikes.
   9. Diagnostic circuitry and lamps indicating:
      9.1. LINE OK
      9.2. LINE FAULT
      9.3. PROTECTION PRESENT

23. The power distribution assembly shall meet the following requirements:

1. Maximum Energy Absorption: 720 J
2. Transient Response Time: instantaneous (0.1 ns)
3. Rated Current and Load Handling: 15 Amperes Max (1,800 W), 15 A per socket (1,800 Watts) Rated Voltage: 120 V(ac), 50/60 Hz.
4. Meet UL 1449, UL 1283 and UL 497A specifications.

H. Circuit Breaker: 15 A.

I. Receptacles: 6 (NEMA 5-15R).
24. Interconnect and Termination Unit

The Contractor shall furnish and install all related equipment to interface the rack mount interconnect and termination unit (ITU) to the incoming fiber optic communications cable and the patchcord fiber optic cable.

25. The ITU shall be a modular enclosure that provides interconnect capability of one multi-fiber cable to a minimum of 12 single fiber cable. The ITU shall be environmentally sealed and contain grommets at the cable entrances to prevent any ingress of dirt or moisture. Strain relief shall be provided for the fiber optic cable. The ITU shall contain a splice tray, connector panel and the appropriate number of pigtails which will be fusion spliced to the incoming fiber cable. Each fiber shall be fusion spliced to a pigtail with a factory installed and polished SC connector. Each pigtail shall be labeled and secured onto cable as described elsewhere in these special provisions. Brackets shall be provided to spool the incoming fiber optic cable to minimum of 3 turns before separating out individual fibers to the connector panel.

26. RA

The ITU shall be packaged in a rack unit with approximate dimensions of 17" (W) x 2" (H) x 12" (D) and have a metal housing slide-out shelf. The ITU shall contain grommets at cable entrances and provide strain relief for the fiber cable. The ITU shall accommodate 12 singlemode fibers having SC type connector feed through adapters and 12 interconnection points or 12 splices. The components of the passive interconnect package shall be installed in the ITU.

27. RA

The ITU shall be a metal enclosure with a hinged door. The door shall have a latch or thumbscrew to hold the door in the closed position. An opening shall be provided on the back side of the incoming fiber optic communications cable. Connector panels (for up to 12 SC connectors) shall be provided inside the enclosure. Strain relief shall be provided for the incoming fiber optic cable. A guard shall be provided to protect the patchcord fiber optic cables plugged into this enclosure.

28. CAMERA ASSEMBLY

The camera assembly shall consist of:

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera Module</td>
</tr>
<tr>
<td>Environmental Enclosure</td>
</tr>
<tr>
<td>Video Encoder</td>
</tr>
</tbody>
</table>

29. The camera assembly units shall be fully assembled, pressurized and tested at the original manufacturing facility and shipped as a complete unit, ready for installation.
30. Camera Module

1. Image Sensor: Progressive ScanEx View ICX445AKA CCD
2. Image Size: Diagonal (1/3" type)
3. Image Resolution: 1280 (H); 720 (V)
4. Picture Elements (total): 1348 (H) x 976 (V)
5. Video Output: 16 Bit Digital YUV: 4.2.0
6. Day/Night Operation: Adjustable (Auto, Color and Mono Modes) via removable IR cut filter
7. Maximum Lens Aperture: f/1.6 (wide) to f/2.8 (telescopic)
8. Optical Zoom Range: 18X, 4.7 mm to 84.6 mm with X4 Digital zoom from web browser
9. Optical Zoom Speed: Two speeds, from approximately 3.5 to 5 seconds full range
10. Horizontal Angle of View: Optical: From 55.2 to 3.2 degrees
11. Minimum Focus Distance: 0.01 m (wide); 1.0 m (telescopic)
12. Auto Focus: Selectable Auto/Manual; Minimum Scene Illumination for Reliable Auto Focus shall be no more than 50 percent video output.
13. Manual Shutter: Selectable shutter speeds shall be from 1/30 to 1/10,000.
14. Auto Iris: Selectable auto/manual; Iris shall automatically adjust to compensate for changes in scene illumination to maintain constant video level output within sensitivity specifications.
15. Sensitivity: Scene Illumination; F1.6 at 50 percent video
16. 1.8 Lux (0.18 fc) at 1/30 shutter, color mode
17. 0.1 Lux (0.01 fc) at 1/30 shutter, mono mode

31. Environmental Enclosure

The environmental enclosure shall be a corrosion resistant and tamperproof sealed and pressurized housing with 5 psi dry nitrogen with Schrader purge fitting and 20 psi relief valve for each camera. The size of the housing shall be 3.5 in diameter or smaller.

32. The camera housing shall include a loss of pressure sensor that will trigger an alarm message that will be inserted in the video output signal when the pressure drops below 0.5 psi.

33. The enclosure shall be constructed from 6061-T6 standard aluminum tubing with a wall thickness of 0.25 ±0.03 inch. Internal components shall be mounted to a rail assembly. A copper plated spring-steel ring shall be used to ensure electrical bonding of the rail assembly and components to the camera housing. The housing exterior shall be finished by pre-treatment with conversion coating and baked enamel paint. The camera enclosure shall be designed to withstand the effects of sand, dust, and hose-directed water.
34. The internal humidity of the housing shall be less than 10 percent, when sealed and pressurized. Desiccant packs shall be securely placed inside the housing to absorb any residual moisture and maintain internal humidity at 10 percent or less.

35. A sun shield shall be provided to shield the entire housing from direct sunlight.

36. The camera assembly shall meet the following requirements:

36a. Pan and Tilt Drive Unit Requirements:

1. Must be capable of continuous rotation in either direction.
2. Tilt movement shall be 130 degrees, from +40 to – 90 degrees unobstructed.
3. Pan Speed (Operator Control) shall be variable from 0.1°/s to 40 °/s
4. Pan Speed (Preset Control) shall be greater than 100°/s
5. Tilt Speed (Operator Control): Variable from 0.1°/s to 20°/s
6. Tilt Speed (Preset Control): 40°/s
7. The 64 Pan and Tilt preset positions shall be repeatable within ± 0.5°

36b. Power Requirements:

1. Operating voltage shall be from 108 V(ac) to 132 V(ac), 120 V(ac) nominal, 50/60 Hz. (±3.0 Hz).
2. Power consumption shall not exceed a total of 95 Watts.
3. Camera/receiver/P&T driver (pan & tilt in motion) power not to exceed 40 Watts.
4. Power for the heater (heater on) shall not exceed 6 Watts.

36c. Environmental Specifications

The environmental enclosure shall meet the minimum standard requirements as set forth in Section 2 of the NEMA Standard Publication No. TS2 for temperature, vibration, shock, external icing, corrosion protection and the following:

1. Temperature: –34C to 74C tested across low and high voltage ranges per Nema TS2 paragraphs 2.1.2 and 2.1.3.
2. Vibration: Per Nema TS2 paragraphs 2.1.9, 2.2.3, 5 30Hz sweep @ 0.5g applied in each of 3 mutually perpendicular planes.
3. Shock: Per Nema TS2 paragraphs 2.1.10, 2.2.4, 10g applied in each of 3 mutually perpendicular planes.
3.1. Water Spray: Per IEC 60529+A1, 1999, Para 14.2.6, Solid water stream delivered thru 12.5 mm nozzle at 25 gallons/minute at 9 ft for 3 minutes

5. External Icing: Per Nema TS2 250-2003, paragraphs 5.6

6. Corrosion Protection: Per Nema 250-2003, paragraphs 5.10

3.2. Humidity: From 0 to 100 percent N.C per MIL-E-5400T, paragraphs 3.2.24.4


4. Mechanical Specifications:

4.1. The weight shall not exceed 28 lb.

4.2. The dimensions shall not exceed 17" (height) by 11" (width).

5. Mounting Specifications

Four (4) mounting holes shall be from 0.39 inches to 0.43 inches in diameter and match the bolt pattern as detailed in Caltrans standard plans sheet ES-16A (Camera Mounting Plate) as found in the Standard Plans.

6. Main Interface Connector

The main interface connector shall be equivalent to an Amphenol 206036-3 with back shell 206070-1 and mating connector equivalent to an Amphenol 206037-11 with clamp 206070-1.

Video Encoder

The CCTV assembly system shall fully integrate within the H.264/MJPEG encoding component with functions as specified below:

1. Video Encoding: H.264 (Main Profile/Level 3.1) and MJPEG standards.

2. Video Streams: Two independently configurable streams; (2) H.264 streams or (1)H.264 and (1) MJPEG or (1) H.264 or MJPEG and 1 NTSC.

3. Video Stream Configuration Properties (Stream Settings):

3.1. Video Stream 1: H.264

3.2. Video Stream 2: H.264 or MJPEG

64. Image Resolution: 720p, D1, VGA, CIF

75. Streaming Mode: CBR or VBR

86. Image Settings: (GOP (M, N)), Quality Value

97. Frame Rate: 30, 15, 7, 4, 2, 1
Connection Types: Uni-cast, multi-unicast or multi-cast

Data Rate: Adjustable from 64 k to 8 Mb/s CCTV assembly Video Latency: <150 ms

Network Protocol Layers: RTP, RTSP, UDP, TCP, IP, HTTP, IGMPv2, ICMP, ARP as a minimum

Operational parameters of the video encoder shall meet the following:

38a.

1. Functional Capabilities:

   1.1. Provide an integrated network Internet Protocol (IP) camera providing: 720p/30 video with H.264/MJPEG compression and encoding for providing video images transported over standard Ethernet infrastructures.

   1.2. Integrate an HDTV standards 720p resolution at 30 frames/s day/night camera with integral 18x motorized zoom optics, an H.264/MJPEG ASIC based encoding engine and network communication circuitry Automatic and user-selectable speed setting

   1.3. Support for uni-cast and multi-cast connections, using RTP/RTSP network layers

   1.4. Provide an integral web HTTP server allowing password protected administration/configuration capabilities along with full camera and positioning system control and viewing functions.

   1.5. Provide a software development kit (SDK) for allowing any 3rd party developers all necessary tools for integrating the camera assembly system into the users control system environment.

   1.6. Provide hybrid capability delivering both Ethernet and analog composite video and RSEI422 serial connections for external system connections and control.

   1.7. The positioning drive system shall provide speed capability from 0.1 to 80 degrees per second, with a 0.25 degree repeatability, 360 degree continuous pan rotation, and from +90 to –90 degree tilt range as a minimum.

   1.8. Include an advanced ID generation capability for indications of viewing direction, compass setting, azimuth/elevation position, location descriptors and user defined image/logo.

   1.9. Be designed conforming to NEMA TS2 requirements for power, shock and vibration as well as IP66 and IP67 environmental standards.

38b.

2. Communication and Camera Addressing Protocol:

   2.1. Serial data communications ports conforming to EIA/TIA-232 and EIA/TIA-422.

   2.2. Configurable to support NTCIP 1205 v01.08 - NTCIP Objects for CCTV Camera Control.

   2.3. Via the CCTV protocol, the user shall be able to obtain camera position information including tilt angles, pan positions and zoom levels. The information shall be
supplied as from zero degree to 359 degrees azimuth and from –95 degree to +95 degree elevation.

2.4. Cohu and Javelin protocols or equivalent.
2.5. TCP/IP 100 Base T Fast Ethernet data communication port.

38c.
Upon receipt of any given command, the camera positioning system shall not take longer than 1.0 second to respond.

38d.
All programmable functions shall be stored in non-volatile memory and shall not be lost if a power failure occurs. System configurations such as video privacy zones, preset text and sector ID shall be able to be stored in a computer file and a camera personality can be cloned or uploaded into a camera in the event that a camera replacement is necessary.

38e.
The communications transmission interface shall be terminated with appropriate connector. If required a converter shall be supplied to transform EIA-422 to EIA-232.

38f.
3. Backward Compatibility with Mpc-M-100/104/105 Master Controller:

3.1. Address Selection: Same on Camera Positioning System.
3.2. Camera Power ON/OFF: Camera turns on/off.
3.3. Auto / Manual Iris Select: Same on Camera Positioning System.
3.4. Fast / Slow: Provides two speeds for zoom.
3.6. BLUE: Increases blue level.
3.7. RED: Increases red level.
3.8. ZOOM: Same on Camera Positioning System.
3.9. FOCUS: Focus Control if in Manual focus mode, no effect if in auto focus mode.
3.10. IRIS: Iris Control if in Manual iris, no effect if in auto iris.
3.11. PAN / TILT: Controls Pan and Tilt direction. Speed of pan and tilt is determined by Fast / Slow mode selection and by optical zoom position of lens, so that the narrower the field of view the slower the pan and tilt speed. In the fast mode, the pan speed shall be adjusted to provide approximately 1 1/2 to 2 1/2 fields of view per second. In the slow mode the pan speed shall be adjusted to provide approximately 1/2 to 1 field of view per second. The tilt speed shall be adjusted to remain proportional to the pan speed.

38g.
4. Presets
Allows Presets 1 through 10 to be set or recalled. Selecting presets 1-10 shall control presets 33 through 42 stored in Camera Positioning System.
38h.

5. Character Generator Specifications:

5.1. ID Characters are white with a black border.
5.2. A maximum of six lines of user programmable alphanumeric text can be displayed, plus two fixed display lines for low-pressure indicator and Privacy Zones.
5.3. Text shall only be displayed in uppercase characters.
5.4. Camera ID shall be up to 2 lines, each up to 24 characters long. If both lines are programmed Line 1 of Camera ID shall always appear above Line 2 of Camera ID regardless of top or bottom selection.
5.5. Preset ID: 1 line with up to 24 characters long, user programmable for each of the 64 preset positions. When a preset position is recalled the corresponding preset ID shall be displayed. The preset ID shall remain displayed until a pan, tilt, zoom, manual focus, auto focus select, or another preset command is received.
5.6. Low Pressure Indicator: 1 line, "Low Pressure", messages shall be displayed in "blinking" or "non-blinking" mode and be displayed when activated by low internal pressure. Adjustable set points by altitude shall be provided via the serial port to activate low-pressure. Message shall be enabled or disabled.
5.7. Temperature Indicator shall be 1 line, in degrees C and numeric messages shall be displayed in "blinking" or "non-blinking" mode. Message shall be enabled or disabled.
5.8. Sector Message: Up to 16 sectors in 360 degrees may be defined with up to 24 characters long.
5.9. Message shall be programmable via the RS-422 serial communications.
5.10. Message positioning shall be accomplished by padding left side of message with spaces.
5.11. Messages can be positioned at either the top or the bottom of display. Blank lines are not displayed. Any programmed line being displayed shall fill in toward the top if top positioning is selected or toward the bottom if bottom position is selected.

38i.

6. Privacy Zones:
Video blanking for up to 8 Privacy zones shall be provided. The video shall be blanked out for privacy of 1 line; numeric messages can also be displayed. Message shall be displayed in "blinking" or "non-blinking" mode and be enabled or disabled. Privacy Zones shall be programmed via the RS-422 serial communications.

38j.

7. Maintenance Functions:

JRG***

The camera system shall support maintenance features as defined below:
7.1. Querying of camera parameters via the Ethernet connection.
7.2. The camera parameters consists of:
7.2.1. Serial Number
7.2.2. Software Revision
7.2.3. Assembly Date
7.2.4. Camera Model Number

7.3. Internal temperature and pressure monitoring and reporting
7.4. Remote software upload and updates via Ethernet
7.5. Camera device auto discovery of IP address
7.6. Camera system auto re-connect
7.7. Camera system reset
7.8. Save and restore camera system start-up configuration

38k.

8. IP Management:

The CCTV assembly shall provide at minimum the following network configuration properties:

8.1. IP Configuration: DHCP or Static IP address entry.
8.2. Net mask address entry
8.3. Gateway address entry
8.4. Domain name entry
8.5. DNS server entry

38l.

9. Tour Sequencing Requirements:

9.1. Eight - tour sequence may be defined.
9.2. Programming of the tour sequences shall be accomplished by the selection of a preset position (by number), and then selection a dwell time. The presets can be used in any order, and the same preset may be used more than once as long as the total number of preset positions used does not exceed 32.
9.3. The dwell time defines the length of time paused at each preset position. It can be from 1 second to 60 seconds. The dwell time is can be changed individually for all stops on the tour.
9.4. If the appropriate preset ID is programmed, it shall be displayed for each preset position used on the tour.
9.5. The tour shall stop upon receipt of a pan command.
9.6. All programmable functions shall be stored in non-volatile memory.
39. **CAMERA TRANSCEIVER**

The Contractor shall furnish and install a camera transceiver (TCVR) at the camera site to interface with the CCTV camera assembly, and with the fiber optic cable.

40. The TCVR shall operate on one single mode fiber.

41. The TCVR shall support high quality, simultaneous two-way transmission of camera control data and one-way transmission of camera video over one single mode fiber. The TCVR shall receive RS-232 data for the CCTV assembly and shall transmit NTSC video from the CCTV camera assembly.

42. The TCVR video transmission and data receiving format used in the camera junction box shall be compatible with the TCVR video receiving and data transmitting format used in the communications hub structure.

43. The TCVR may be packaged as one surface mountable module or may be individual components such as a receiver, transmitter and wavelength division multiplexer to combine both data and video onto one single mode fiber.

44. Supply voltage shall be 120 V(ac) ±10 percent, 60 Hz. Lower voltage units will be acceptable if a UL listed power conversion module is used to adapt from the 120 V(ac) source.

45. Power required shall be 50 W maximum.

46. Mounting shall be to a flat wall surface.

47. Operating temperature range shall be from -40 to +162°F minimum range.

48. Video transmitter section shall meet the following requirements:

<table>
<thead>
<tr>
<th>Input Level</th>
<th>1 V(p-p) (NTSC composite)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal-to-Noise ratio at minimum receiver input:</td>
<td>50 dB Min</td>
</tr>
<tr>
<td>Differential phase (From 10 to 90 percent APL):</td>
<td>3 degrees Max</td>
</tr>
<tr>
<td>Differential gain (From 10 to 90 percent APL):</td>
<td>3 percent Max</td>
</tr>
<tr>
<td>Frequency Response:</td>
<td>From 100 kHz to 5.5 MHz: ±0.30 dB Max&lt;br&gt;From 5.5 MHz to 8 MHz: ±0.6 dB Max</td>
</tr>
</tbody>
</table>
48a.

1. RS-232 receiver section shall meet the following requirements:
   
   1.1. Data rate: \textit{From} DC to 9.6 kbps \textit{Min}
   1.2. Bit error rate: $10^{-9}$ \textit{Max}

48b.

2. Optical shall meet the following requirements:

   1. Video transmitter shall meet the following requirements:
      
      2.1. Operating wavelength: 1300 nm or 1550 nm
      2.2. Launch power: -14 dBm \textit{Min}
      2.3. Sensitivity (receiver): -28 dBm \textit{Max}
      2.4. Loss budget: 14 dB \textit{Min}
      2.5. Fiber compatibility: 8.3/125 \textmu m singlemode

48c.

3. EIA-232 receiver shall meet the following requirements:

   3.1. Operating wavelength: 1300 nm or 1550 nm
   3.2. Loss budget: 20 dB
   3.3. Fiber compatibility: 8.3/125 \textmu m singlemode

48d.

4. Connectors shall meet the following requirements:

   4.1. Video input: BNC
   4.2. EIA-232: DB-9, DB-15 or DB-25
   4.3. Optical: Type SC

49.

The TCVR units shall be tested prior to installation to ensure proper operation with the camera control transmitter.

50.

The Contractor shall confirm the operation of the TCVR, after installation, using test equipment which emulates all the functions of the camera control transmitter, and shall document all results and keep test equipment in operation until witnessed and approved by the Engineer.

51.

The Contractor shall confirm equipment placement with the Engineer before installing any equipment.
52.

After installing all TCVR units and the communication system, the Contractor shall demonstrate operation of the camera control system and assign all system parameters using the camera control system located at the communication hub that the CCTV is assigned to.

53.

The camera control system functions shall be tested on all TCVR units and shall operate all remote control functions, for example pan and tilt, zoom in and out, focus near and far, set up, and recall up to eight preset positions per remote TCVR address. The response of the camera control system shall appear to be instantaneous.

54.

The Contractor shall demonstrate the camera control system to show that it can access all TCVR units.

55.

Testing of the transceiver.

Where is "TCVR-CH" defined? JRG***

It is my understanding that we can delete any reference to the TCVR-CH or any work that is in the HUB RA

RA

The Contractor shall be responsible for all testing and documentation required for proper installation and operation of the camera transceivers, materials and equipment. The following identifies the specific quality control requirements for both the TCVR and TCVR-CH (Communication Hub). The TCVR-CH is described elsewhere.

56.

Prior to installation all transceivers shall be tested. The Contractor shall input a standard level video test signal into the TCVR at the camera site and adjust the optical power output of the TCVR to receive a mid-range optical power level for the distance end TCVR-CH located at the communication hub needed to produce the required video receiver output level.

57.

The distance end TCVR-CH's video output shall then be connected to a monitor for viewing with the level adjusted to the mid-range of any output settings. The Contractor shall then qualitatively assess the monitor output. Video shall be of high quality with good color and no image ghosting. The signal-to-noise ratio and signal-to-low frequency noise ratio shall be measured and recorded. No optical attenuation devices shall be used to reduce optical signals to required operating range. All indicators shall be verified to function correctly.

58.

COMPOSITE CABLE

The interconnect wiring between the CCTV camera assembly, pan and tilt unit and the transceiver (TCVR) and the camera control receiver (CCR) shall be a composite cable that includes flexible 75 Ohm coaxial cable, power conductors, control cable and a separate CAT 5E outdoor rated cable.
59. Connectors shall be in accordance with manufacturer's recommendation.

60. Interconnect wiring and connectors shall be supplied and installed to make the CCTV subsystem completely operational.

61. Specifications of all cable assemblies, including connectors with strain relief backshells, shall be submitted to the Engineer as part of the shop drawings for review and approval.

62. Wiring shall run continuous from source to destination without splices.

63. Cables shall be installed without damaging the conductors, insulation, or jacket. The coaxial cables shall not be kinked or bent tighter than the manufacturer's recommended bending radius.

64. Sufficient slack shall be provided for equipment movement. The cable shall be secured and protected from physical damage.

65. All interconnect wiring and connectors shall meet or exceed all necessary standards with regards to voltage, current, and environmental ratings.

66. Control cable shall be routed from the CCTV camera assembly and pan and tilt drive unit to the CCR and TCVR inside the camera pole. A ground wire shall be provided between the CCTV camera assembly and the camera pole.

67. When interconnect cable is broken out onto a terminal strip, the coaxial cable shall be terminated with a BNC type connector. The BNC type connectors shall be an integral part of the terminal strip.

68. The cables and connectors shall be installed to allow the camera and lens to be disconnected without removing the environmental camera enclosure and to remove the environmental camera enclosure (including camera) without removing the pan and tilt drive unit.

69. The Contractor shall be responsible for all testing and documentation required to establish approval and acceptance of the production, installation, and operation of these materials and equipment.

70. The following identifies the specific quality control requirements for this special provision:

1. The Contractor shall test all cables for continuity and shorts or grounds. Tests on cables with connectors attached (connectorized) shall be performed after installation.
2. The Contractor shall carry out system integration testing to ensure that the video interface and camera interconnect wiring performs to the specified standards when used in operation with all other devices installed under this project.

71.

ACCEPTANCE TESTING

Upon installation of the CCTV system in the field, the Contractor shall perform the following tests locally in the presence of the Engineer, with a Contractor provided camera controller. The camera controller can be a laptop computer with the latest version of the vendor supplied camera control software and be compatible with the CCTV system.

71a.

1. Iris Auto//Manual Operation:

   1.1. With IRIS Auto/Manual switch in Manual, open Iris and verify that the video image lightens.
   1.2. Close the Iris and verify that the video image darkens.
   1.3. Open the Iris to lighten the image and then switch IRIS Auto/Manual switch to auto. Verify that the camera iris closes to produce the original video image.
   1.4. Close the Iris to darken the image and then switch IRIS Auto/Manual switch to auto. Verify that the camera iris opens to produce the original video image.

71b.

2. Focus Auto/Manual Operation:

   2.1. With Focus Auto/Manual switch in Manual, demonstrate that the camera can focus on objects both near and far in the field of view.
   2.2. Focus near, then switch FOCUS Auto/Manual switch to auto and demonstrate that the camera focus adjusts automatically to bring the image back in focus.
   2.3. Focus far, then switch FOCUS Auto/Manual switch to auto and demonstrate that the camera focus adjusts automatically to bring the image back in focus.

71c.

3. Zoom Telephoto//Wide Operation:

   3.1. With the IRIS and FOCUS Auto/Manual switches in Auto the Contractor shall demonstrate that the auto IRIS & FOCUS adjustments operate with a focused picture present in the video image and that the picture zooms in and out.
   3.2. With IRIS and FOCUS Auto/Manual switch in Manual and operating the Zoom from wide angle to Telephoto the Contractor shall demonstrate that all IRIS and FOCUS adjustments do not operate as if in Auto and that picture still zooms in and out.
   3.3. Demonstrate that the Digital zoom functions through 10 times the focal length.
71d.
4. Tilt Operation
   The Contractor shall demonstrate that with Iris and Focus in Auto, and Zoom in wide mode that the camera has free movement with a minimum range from +30 to –80 degrees elevation range travel.

71e.
5. Pan Right/Left Operation
   The Contractor shall demonstrate that with Iris and Focus in Auto, and Zoom in wide mode and with the camera tilted range from +30 to -80 degrees the camera shall rotate with free movement, with a minimum of 360° pan travel range.

71f.
6. Camera Preset Operation:
   6.1. Using camera control software the Contractor shall demonstrate that the camera system shall execute a minimum of 6 various preset positions employing various degrees of zoom, pan and tilt. The camera must move freely from on preset position to the next. The camera system shall not take more than 4 seconds to go to a preset position. Once in the preset position the camera shall not move unless directed by another command.
   6.2. The camera control software shall automatically and continuously test all 6 preset positions in succession for a minimum of one hour.

71g.
7. ID Generation
   Using camera ID Generator and vendor supplied camera control software the Contractor shall demonstrate the insertion of 20 text characters into the video image.

71h.
8. Performance:
   8.1. Streaming outputs: 720x480 at 15FPS, 176x144 at 6FPS, and a 320x240-JPEG image.
   8.2. A thermal monitor may be enabled to maintain the processor within the published specification.
   8.3. The video output stream generated from the test archive file shall be continuous/seamless and without error/glitches when played back.

WARRANTY

The camera assembly shall be warranted against defects and any failure which may occur through normal use for a minimum of four (4) years from the date of delivery.
8. WIRELESS ETHERNET RADIO (WER)

WIRELESS ETHERNET RADIO (WER)

DESCRIPTION

The Wireless Ethernet Radio (WER) Assembly shall include the WER radios, WER antennas and WER interconnect wiring.

WER RADIO

8-9-10, RS***

The Wireless Ethernet Radio (WER) shall provide a wireless serial RS-232 and Ethernet communication link to stand-alone field elements. The WER shall act as a RS-232 and Ethernet gateway.

Carrier Detect (CD) or Clear to Send (CTS) signal shall be asserted 0.1s +/- 0.01s prior to data being transmitted and shall be de-asserted 0.1s +/-0.01s after the last byte sequence is transmitted.

WER radio minimum requirements:

1. Frequency of Operation: 902 – 928 MHz
2. Spread Spectrum: Frequency Hopping and DTS
3. Hopping Channels: 50/Pattern
4. Error Detection: 32bitCRC, ARQ
5. RF Data Rate: 345kbps and 1.384Mbps upgradable to 1.9Mbps
6. Ports: 1 RS-232/RS-485/RS-422, 1 RS-232 Serial Port, 1 Ethernet, 1 USB
7. Serial Baud Rate: 300 baud to 921 kbaud
8. Receiver Sensitivity: -97dBm at 1.384Mbps and -105dBm at 345kbps
9. Data Encryption: 128 bit AES upgradable to optional 256 bit AES
10. RF-Power: 100mW to 1W (20-30dBm) programmable in 1dB steps
11. System Gain: 135dB system gain w/unity again antenna
12. Serial Ports: Two RS-232: RxD, TxD, RTS, CTS, DCD, DSR, DTR
    RS-422: Tx+, Tx-, Rx+, Rx-
    RS-485: 4 wire/2wire
    Baud rate: 300bps to 921kbps
13. Serial Connectors: DB-9F and RJ45 mini USB
14. Sleep Mode: Supported on RS-232 and Remote Wake up
15. USB: USB to Serial routing
    USB interface
    USB Console
    USB to Ethernet routing
    Wireless USB to Ethernet Routing
16. Antenna Connector: Reverse Polarity TNC Male
17. Size: 3.75 inches x 2.25 inches x 1.75 inches
18. Ethernet: RJ-45, 10/100 BaseT IEEE 802.3
TCP, UDP, ARP, ICMP, DHCP, HTTP, SNMP
Serial to IP conversion, Quality of Service, Firewalling
Features and Port blocking

20. Management: Local Serial Port Console, Telnet, HTTP, HTTPS
21. Diagnostics: Battery voltage, Temperature, RSSI
Remote diagnostics

22. Operating Modes: Point-to-Point, Point-to-Multipoint, Store
Forward Repeater, Peer-to-Peer

23. Ethernet Interface: RJ-45, 10/100BaseT, IEEE 802.3 Ethernet compliant auto-
sense, auto-negotiate

24. Operating Temperature: -40°C to +85°C

WER ANTENNA - OMNI DIRECTIONAL
The WER Omni Directional Antenna shall be compatible with the WER.

Antenna minimum requirements:

1. Form Factor: 25” maximum height
2. Beam Width: Omni Directional
3. Frequency: 902-928 MHz
4. VSWR: 1.5:1 or Less
5. Power: 150 Watts max
6. Gain: 8db-Meg
7. Impedance: 50 ohm
8. Connector: N-type Female
9. Environmental: -40°C to +70°C

WER ANTENNA-DIRECTIONAL
The WER Directional Antenna (DA) shall be compatible with the WER.

Antenna minimum requirements:

1. Bandwidth: >70 MHz auto-negotiate
2. Beam Width: 65° Horizontal / 55° Vertical
3. Polarization: Vertical / Horizontal
4. Radiation: Directional
5. Frequency: 902-928 MHz
6. VSWR: 1.5:1 or Less
7. Power: 300 Watts max
8. Gain: 6dBd
9. Lightning Protection: DC Ground
10. Wind Velocity: >100MPH
11. Impedance: 50 ohm
12. Feed Connection: Reverse Polarity TNC (N-Female)
13. Maximum Length: 41.5"
14. Mounting: For both Polarizations
15. Environmental: -40°C to +70°C

**Certificate of Compliance**

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with NEMA TS1/2 Environmental Requirements for Traffic Control Equipment.

**WER INTERCONNECT WIRING**

The WER interconnect wiring consists of the coaxial and CAT 5E cables and shall be installed as shown on the plans, as specified in these special provisions and as recommended by the manufacturer.

All connectors shall be in accordance with the manufacturer’s recommendation. All connectors installed outside the enclosure shall be weather proof and watertight. Weather proofing and water sealing shall be included, provided and installed.

Specifications of all cable assemblies, including connectors with strain relief backshells, shall be submitted to the Engineer as part of the shop drawings for review and approval.

Interconnect cabling and wiring shall run continuous from the source to destination without splices.

Three feet of slack shall be provided for equipment movement. All cabling shall be secured and protected from physical damage.

All interconnect wiring and connectors shall meet or exceed all necessary standards with regards to voltage, current and environmental ratings.

The Contractor shall be responsible for all testing and documentation required to establish approval and acceptance of the production, installation and operation of these materials and equipment.

The Contractor shall test all cables for continuity and shorts or grounds. Tests on cables with connectors attached (connectorized) shall be performed after installation.

The Contractor shall carry out system integration testing to ensure that the interfaces and all interconnect wiring and cabling perform to the specified standards when used in operation with all other devices installed under the contract.

The Contractor shall configure interconnect wiring and cabling at all locations shown on the project plans.

**Coaxial cable**

The antenna coaxial cables to be used for 5.7 GHz and 900 MHz RF connections shall be of 50 ohms impedance, low loss, flexible, rugged and UV resistant, and shall have greater than 90 dB RF shielding. The coaxial cable shall have a minimum bend radius of 1". Attenuation for 900 MHz shall not exceed 15 dB /100 m. Attenuation for 5.7GHz shall not exceed 40 dB /100 m.
9. DRAINAGE INLET PROTECTION

USE WITH 2006 STANDARDS.

NOTE: This nSSP is based on the SSP 07-490_English_A03-13-09.

Use as a permanent sediment control to filter or settle sediment-laden runoff before discharge into a storm drainage system at drainage inlets in unpaved areas.

Include a detail for the drainage inlet protection in the plans. The detail is based on the temporary drainage inlet protection (Type 4A).

Use BEES item 074061A “Drainage Inlet Protection”

Areas of application must be shown on the plans

10-1. DRAINAGE INLET PROTECTION

GENERAL

Summary

1

This work includes constructing and maintaining drainage inlet protection as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Submittals

2

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Rolled erosion control products
2. Fiber rolls
3. Fasteners

MATERIALS

Rolled Erosion Control Products

3

RECP must be a long-term, degradable, open-weave textile manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment, and protection of vegetation. RECP must conform to the classification system established by the Erosion Control Technology Council. RECPs must be:

1. Netting must be made of coconut fiber woven into a matrix. Netting must comply with the requirements shown in the following table:
### Netting

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>--</td>
<td>ECTC Type 4</td>
<td>--</td>
</tr>
<tr>
<td>Minimum thickness</td>
<td>A, B, C</td>
<td>0.30 inch</td>
<td>--</td>
</tr>
<tr>
<td>Roll width</td>
<td>A, B, C</td>
<td>72–158 inches</td>
<td>--</td>
</tr>
<tr>
<td>Matrix</td>
<td>A, B, C</td>
<td>100% woven coir (coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td>Universal Soil Loss Equation (USLE) C-Factor for a 1:1 (H:V) unvegetated slope</td>
<td>A, B, C</td>
<td>≤ 0.25</td>
<td>--</td>
</tr>
<tr>
<td>Maximum shear stress</td>
<td>A</td>
<td>2.25 psf</td>
<td>ASTM D 6460</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>4.4 psf</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>4.6 psf</td>
<td></td>
</tr>
<tr>
<td>Minimum tensile strength</td>
<td>A, B, C</td>
<td>125 psf</td>
<td>ASTM D 5035</td>
</tr>
<tr>
<td>Functional longevity</td>
<td>A, B, C</td>
<td>36 months</td>
<td>--</td>
</tr>
<tr>
<td>Average open area</td>
<td>A</td>
<td>63 ± 5%</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>48 ± 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>38 ± 5%</td>
<td></td>
</tr>
<tr>
<td>Minimum weight of fabric</td>
<td>A</td>
<td>11.8 oz/sq yd</td>
<td>ASTM D 3776</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>20 oz/sq yd</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>26 oz/sq yd</td>
<td></td>
</tr>
</tbody>
</table>

2. Erosion control blanket must be made of processed natural fibers that are mechanically, structurally, or chemically bound together to form a continuous matrix that is surrounded by 2 natural nets. The erosion control blanket must comply with the requirements shown in the following table:

### Erosion Control Blanket

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>--</td>
<td>ECTC Type 2D</td>
<td>--</td>
</tr>
<tr>
<td>Net type</td>
<td>A, B, C</td>
<td>Natural</td>
<td>--</td>
</tr>
<tr>
<td>Number of nets</td>
<td>A, B, C</td>
<td>Double</td>
<td>--</td>
</tr>
<tr>
<td>Minimum roll width</td>
<td>A, B, C</td>
<td>72 inches</td>
<td>--</td>
</tr>
<tr>
<td>Matrix</td>
<td>A</td>
<td>70/30% (straw/coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>100% woven coir (coconut fiber)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Wood excelsior (80 percent of the fiber 6 inches or longer)</td>
<td>--</td>
</tr>
<tr>
<td>Universal soil loss equation (USLE) C-Factor for a 2:1 (H:V) unvegetated slope</td>
<td>A, B, C</td>
<td>≤ 0.20</td>
<td>--</td>
</tr>
</tbody>
</table>
Fiber Rolls

4

Fiber roll must have a minimum functional longevity of 120 days and comply with the following requirements:

1. Type A fiber roll must be fabricated from an erosion control blanket rolled along its width. Secure with natural fiber twine at 6-foot intervals, and 6 inches from each end. Fiber roll size must comply with either one of the following:

1.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 0.5 lb/ft
1.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 2 lb/ft

2. Type B fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Rolls must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end. Fiber roll size must comply with either one of the following:

2.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 1.1 lb/ft
2.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 3 lb/ft

Fasteners

5

Wood stakes must be untreated fir, redwood, cedar, or pine and cut from sound timber. Ends must be pointed for driving into the ground. Notched stakes must be at least 1 by 2 by 24 inches in size. Stakes without notches must be at least 1 by 1 by 24 inches.

6

Steel staples must be a minimum of 11 gauge, 6-inch U-shaped staple with a 1-inch crown. Provide heavier gauge and greater length if required by the site conditions. You may use an alternative attachment device such as a 100 percent biodegradable fastener to install RECP instead of staples.

7

Rope to fasten fiber rolls and compost socks must be 1/4-inch diameter and biodegradable such as sisal or manila.

<table>
<thead>
<tr>
<th>Maximum shear stress</th>
<th>A, B, C</th>
<th>1.75 psf</th>
<th>ASTM D 6460</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum tensile strength</td>
<td>A, B, C</td>
<td>75 psf</td>
<td>ASTM D 5035</td>
</tr>
<tr>
<td>Functional longevity</td>
<td>A, B, C</td>
<td>12 months</td>
<td>--</td>
</tr>
</tbody>
</table>
CONSTRUCTION

8* Replace "erosion control materials" with other final stabilization as described in the specifications.

For drainage inlet protection at drainage inlets in unpaved areas:

1. Before installing the drainage inlet protection, ensure the subgrade has been graded smooth and has no depressed void areas. The subgrade must be free from obstructions, such as tree roots, projecting stones, or foreign matter greater than 1 inch in diameter.
2. Before installing erosion control materials, install drainage inlet protection.
3. Install RECP:
   3.1. Fasten RECP to the surface with staples and embed in a trench adjacent to the drainage inlet
   3.2. Anchor the perimeter edge of the RECP in a trench and tamp
4. Install fiber roll:
   4.1. Fasten with wood stakes every 24 inches along the length of the fiber roll
   4.2. Fasten the ends of the fiber roll by placing a stake 6 inches from the end of the roll
   4.3. Drive stakes into the soil so that the top of the stake is less than 2 inches above the top of the fiber roll
   4.4. Place excess soil from excavation of the key trenches uphill of the installed fiber rolls

Maintenance

9

Repair or replace drainage inlet protection within 24 hours of discovering the damage or longer if allowed by the Engineer.

10

If your vehicles, equipment, or activities disturb or displace drainage inlet protection, repair drainage inlet protection at your expense.

11

Maintain drainage inlet protection in a manner that provides sediment holding capacity and reduces runoff velocities as follows:

1. Remove sediment from drainage inlet protection when sediment is in excess of 2 inches above the surface of the RECP
2. Repair or adjust the fiber roll or RECP when rills or other evidence of concentrated runoff occur beneath the drainage inlet protection
3. Repair or replace the fiber roll or RECP when it becomes split, torn, or unraveled
4. Add stakes when the fiber roll slumps or sags
5. Replace broken or split wood stakes
6. Remove sediment deposits, trash, and debris from drainage inlet protection as needed or when directed by the Engineer. Trash and debris shall be removed and disposed of in
accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. If removed sediment is deposited within project limits, it must be stabilized and not exposed to erosion by wind or water.

**MEASUREMENT AND PAYMENT**

12

Quantities of drainage inlet protection is determined from actual count in place.

13

The contract unit price paid for drainage inlet protection includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the drainage inlet protection, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
10. FLARED END SECTION PROTECTION

USE WITH 2006 STANDARDS.
Use as a permanent sediment control to filter or settle sediment-laden runoff surrounding flared end sections located at the inlet and outlet of culverts.
Include a detail for the flared end section protection in the plans.
Use BEES item 074064A “Flared End Section Protection”
Areas of application must be shown on the plans

10-1. FLARED END SECTION PROTECTION
GENERAL

Summary

This work includes constructing and maintaining flared end section protection as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Submittals

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Rolled erosion control products
2. Fiber rolls
3. Fasteners

MATERIALS
Rolled Erosion Control Products

RECP must be a long-term, degradable, open-weave textile manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment, and protection of vegetation. RECP must conform to the classification system established by the Erosion Control Technology Council. RECPs must be:

1. Netting must be made of coconut fiber woven into a matrix. Netting must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
</table>

March 28, 2012
2. Erosion control blanket must be made of processed natural fibers that are mechanically, structurally, or chemically bound together to form a continuous matrix that is surrounded by 2 natural nets. The erosion control blanket must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>--</td>
<td>ECTC Type 2D</td>
<td>--</td>
</tr>
<tr>
<td>Net type</td>
<td>A, B, C</td>
<td>Natural</td>
<td>--</td>
</tr>
<tr>
<td>Number of nets</td>
<td>A, B, C</td>
<td>Double</td>
<td>--</td>
</tr>
<tr>
<td>Minimum roll width</td>
<td>A, B, C</td>
<td>72 inches</td>
<td>--</td>
</tr>
<tr>
<td>Matrix</td>
<td>A</td>
<td>70/30% (straw/coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>100% woven coir (coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Wood excelsior (80 percent of the fiber 6 inches or longer)</td>
<td>--</td>
</tr>
<tr>
<td>Universal soil loss equation (USLE) C-Factor for a 2:1 (H:V) unvegetated slope.</td>
<td>A, B, C</td>
<td>≤ 0.20</td>
<td>--</td>
</tr>
<tr>
<td>Maximum shear stress</td>
<td>A, B, C</td>
<td>1.75 psf</td>
<td>ASTM D 6460</td>
</tr>
</tbody>
</table>

**Erosion Control Blanket**
Fiber Rolls

3. Type A fiber roll must be fabricated from an erosion control blanket rolled along its width. Secure with natural fiber twine at 6-foot intervals, and 6 inches from each end. Fiber roll size must comply with either one of the following:

   1.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 0.5 lb/ft
   1.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 2 lb/ft

4. Type B fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Rolls must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end. Fiber roll size must comply with either one of the following:

   2.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 1.1 lb/ft
   2.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 3 lb/ft

Fasteners

5. Wood stakes must be untreated fir, redwood, cedar, or pine and cut from sound timber. Ends must be pointed for driving into the ground. Notched stakes must be at least 1 by 2 by 24 inches in size. Stakes without notches must be at least 1 by 1 by 24 inches.

6. Steel staples must be a minimum of 11 gauge, 6-inch U-shaped staple with a 1-inch crown. Provide heavier gauge and greater length if required by the site conditions. You may use an alternative attachment device such as a 100 percent biodegradable fastener to install RECP instead of staples.

7. Rope to fasten fiber rolls and compost socks must be 1/4-inch diameter and biodegradable such as sisal or manila.

CONSTRUCTION

8* Replace "erosion control materials" with other final stabilization as described in the specifications.

For flared end section protection at flared end sections in unpaved areas:
5. Before installing the flared end section protection, ensure the subgrade has been graded smooth and has no depressed void areas. The subgrade must be free from obstructions, such as tree roots, projecting stones, or foreign matter greater than 1 inch in diameter.

6. Before installing erosion control materials, install flared end section protection.

7. Install RECP:

   3.1. Fasten RECP to the surface with staples and embed in a trench adjacent to the flared end section
   3.2. Anchor the perimeter edge of the RECP in a trench and tamp

8. Install fiber roll:

   4.1. Fasten with wood stakes every 24 inches along the length of the fiber roll
   4.2. Fasten the ends of the fiber roll by placing a stake 6 inches from the end of the roll
   4.3. Drive stakes into the soil so that the top of the stake is less than 2 inches above the top of the fiber roll
   4.4. Place excess soil from excavation of the key trenches uphill of the installed fiber rolls

**Maintenance**

9. Repair or replace flared end section protection within 24 hours of discovering the damage or longer if allowed by the Engineer.

10. If your vehicles, equipment, or activities disturb or displace flared end section protection, repair flared end section protection at your expense.

11. Maintain flared end section protection in a manner that provides sediment holding capacity and reduces runoff velocities as follows:

   7. Remove sediment from flared end section protection when sediment is in excess of 2 inches above the surface of the RECP
   8. Repair or adjust the fiber roll or RECP when rills or other evidence of concentrated runoff occur beneath the flared end section protection
   9. Repair or replace the fiber roll or RECP when it becomes split, torn, or unraveled
   10. Add stakes when the fiber roll slumps or sags
   11. Replace broken or split wood stakes
   12. Remove sediment deposits, trash, and debris from flared end section protection as needed or when directed by the Engineer. Trash and debris shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. If removed sediment is deposited within project limits, it must be stabilized and not exposed to erosion by wind or water.
MEASUREMENT AND PAYMENT

12
Quantities of flared end section protection is determined from actual count in place.

13
The contract unit price paid for flared end section protection includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the flared end section protection, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
11. DRAINAGE OUTLET PROTECTION

USE WITH 2006 STANDARDS.

Use as a permanent sediment control to filter or settle sediment-laden runoff before discharge into unlined conveyances, swales, or receiving waters.

Include a detail for the drainage outlet protection in the plans.

Use BEES item 074063A “Drainage Outlet Protection”

Areas of application must be shown on the plans

10-1. DRAINAGE OUTLET PROTECTION

GENERAL

Summary

1

This work includes constructing and maintaining drainage outlet protection as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Submittals

2

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Rolled erosion control products
2. Fiber rolls
3. Fasteners

MATERIALS

Rolled Erosion Control Products

3

RECP must be a long-term, degradable, open-weave textile manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment, and protection of vegetation. RECP must conform to the classification system established by the Erosion Control Technology Council. RECPs must be:

1. Netting must be made of coconut fiber woven into a matrix. Netting must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Netting Property</th>
<th>Type</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Classification

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>--</td>
<td>ECTC Type 4</td>
<td>--</td>
</tr>
</tbody>
</table>

### Minimum thickness

|                      | A, B, C | 0.30 inch                      | --          |

### Roll width

|                      | A, B, C | 72–158 inches                  | --          |

### Matrix

|                      | A, B, C | 100% woven coir (coconut fiber) | --          |

### Universal Soil Loss Equation (USLE) C-Factor for a 1:1 (H:V) unvegetated slope

|                      | A, B, C | ≤ 0.25                         | --          |

### Maximum shear stress

|                      | A       | 2.25 psf                        | ASTM D 6460 |
|                      | B       | 4.4 psf                         |             |
|                      | C       | 4.6 psf                         |             |

### Minimum tensile strength

|                      | A, B, C | 125 psf                         | ASTM D 5035 |

### Functional longevity

|                      | A, B, C | 36 months                       | --          |

### Average open area

|                      | A       | 63 ± 5%                         | --          |
|                      | B       | 48 ± 5%                         | --          |
|                      | C       | 38 ± 5%                         | --          |

### Minimum weight of fabric

|                      | A       | 11.8 oz/sq yd                   | ASTM D 3776 |
|                      | B       | 20 oz/sq yd                     |             |
|                      | C       | 26 oz/sq yd                     |             |

2. Erosion control blanket must be made of processed natural fibers that are mechanically, structurally, or chemically bound together to form a continuous matrix that is surrounded by 2 natural nets. The erosion control blanket must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Erosion Control Blanket</th>
<th>Property</th>
<th>Type</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classification</td>
<td>--</td>
<td>ECTC Type 2D</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Net type</td>
<td>A, B, C</td>
<td>Natural</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Number of nets</td>
<td>A, B, C</td>
<td>Double</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Minimum roll width</td>
<td>A, B, C</td>
<td>72 inches</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Matrix</td>
<td>A</td>
<td>70/30% (straw/coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>100% woven coir (coconut fiber)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>Wood excelsior (80 percent of the</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fiber 6 inches or longer)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Universal soil loss equation</td>
<td>A, B, C</td>
<td>≤ 0.20</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>(USLE) C-Factor for a 2:1 (H:V)</td>
<td></td>
<td>unvegetated slope.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum shear stress</td>
<td>A, B, C</td>
<td>1.75 psf</td>
<td>ASTM D 6460</td>
</tr>
</tbody>
</table>
Fiber Rolls

4

Fiber roll must have a minimum functional longevity of 120 days and comply with the following requirements:

5. Type A fiber roll must be fabricated from an erosion control blanket rolled along its width. Secure with natural fiber twine at 6-foot intervals, and 6 inches from each end. Fiber roll size must comply with either one of the following:

   1.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 0.5 lb/ft
   1.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 2 lb/ft

6. Type B fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Rolls must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end. Fiber roll size must comply with either one of the following:

   2.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 1.1 lb/ft
   2.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 3 lb/ft

Fasteners

5

Wood stakes must be untreated fir, redwood, cedar, or pine and cut from sound timber. Ends must be pointed for driving into the ground. Notched stakes must be at least 1 by 2 by 24 inches in size. Stakes without notches must be at least 1 by 1 by 24 inches.

6

Steel staples must be a minimum of 11 gauge, 6-inch U-shaped staple with a 1-inch crown. Provide heavier gauge and greater length if required by the site conditions. You may use an alternative attachment device such as a 100 percent biodegradable fastener to install RECP instead of staples.

7

Rope to fasten fiber rolls and compost socks must be 1/4-inch diameter and biodegradable such as sisal or manila.

CONSTRUCTION

8* Replace "erosion control materials" with other final stabilization as described in the specifications.

For drainage outlet protection:
9. Before installing the drainage outlet protection, ensure the subgrade has been graded smooth and has no depressed void areas. The subgrade must be free from obstructions, such as tree roots, projecting stones, or foreign matter greater than 1 inch in diameter.


11. Install RECP:
   
   3.1. Fasten RECP to the surface with staples and embed in a trench adjacent to the drainage outlet
   3.2. Anchor the perimeter edge of the RECP in a trench and tamp

12. Install fiber roll:
   
   4.1. Fasten with wood stakes every 24 inches along the length of the fiber roll
   4.2. Fasten the ends of the fiber roll by placing a stake 6 inches from the end of the roll
   4.3. Drive stakes into the soil so that the top of the stake is less then 2 inches above the top of the fiber roll
   4.4. Place excess soil from excavation of the key trenches uphill of the installed fiber rolls

**Maintenance**

9

Repair or replace drainage outlet protection within 24 hours of discovering the damage or longer if allowed by the Engineer.

10

If your vehicles, equipment, or activities disturb or displace drainage outlet protection, repair drainage outlet protection at your expense.

11

Maintain drainage outlet protection in a manner that provides sediment holding capacity and reduces runoff velocities as follows:

13. Remove sediment from drainage outlet protection when sediment is in excess of 2 inches above the surface of the RECP
14. Repair or adjust the fiber roll or RECP when rills or other evidence of concentrated runoff occur beneath the drainage outlet protection
15. Repair or replace the fiber roll or RECP when it becomes split, torn, or unraveled
16. Add stakes when the fiber roll slumps or sags
17. Replace broken or split wood stakes
18. Remove sediment deposits, trash, and debris from drainage outlet protection as needed or when directed by the Engineer. Trash and debris shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. If removed sediment is deposited within project limits, it must be stabilized and not exposed to erosion by wind or water.
MEASUREMENT AND PAYMENT

12
Quantities of drainage outlet protection is determined from actual count in place.

13
The contract unit price paid for drainage outlet protection includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the drainage outlet protection, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
12. CHECK DAM

USE WITH 2006 STANDARDS.

NOTE: This nSSP is based on the 07-415_E_A08-01-08 SSP

Use with erosion control blanket as a permanent sediment control structure in ditches and swales to trap and detain sediment in concentrated flows of storm water runoff. Check dams reduce scour and channel erosion by reducing flow velocity.

Use with SSP 20-010 Erosion Control Blanket or other RECP or TRM used as a ditch and swale lining.

Use BEES item 074062A “Check Dam”

Areas of application must be shown on the plans

10-1. CHECK DAM

GENERAL

Summary

1

This work includes constructing and maintaining check dam as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

Submittals

2

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for:

1. Fiber rolls
2. Fasteners

MATERIALS

Fiber Rolls

4

Fiber roll must have a minimum functional longevity of 120 days and comply with the following requirements:

7. Type A fiber roll must be fabricated from an erosion control blanket rolled along its width. Secure with natural fiber twine at 6-foot intervals, and 6 inches from each end. Fiber roll size must comply with either one of the following:

1.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 0.5 lb/ft
1.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 2 lb/ft

8. Type B fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Rolls must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end. Fiber roll size must comply with either one of the following:

2.1. 8 to 10 inches in diameter, 10 to 20 feet long, and at least 1.1 lb/ft
2.2. 10 to 12 inches in diameter, at least 10 feet long, and at least 3 lb/ft

Fasteners

5
Wood stakes must be untreated fir, redwood, cedar, or pine and cut from sound timber. Ends must be pointed for driving into the ground. Notched stakes must be at least 1 by 2 by 24 inches in size. Stakes without notches must be at least 1 by 1 by 24 inches.

7
Rope to fasten fiber rolls and compost socks must be 1/4-inch diameter and biodegradable such as sisal or manila.

CONSTRUCTION

8
Construct check dams no more than 90 days before project completion.

9
Before installing the flared end section protection, ensure the subgrade has been graded smooth and has no depressed void areas. The subgrade must be free from obstructions, such as tree roots, projecting stones, or foreign matter greater than 1 inch in diameter.

10* Replace "erosion control blanket" if another rolled erosion control product (RECP) is described such as Jute Mesh, Coir Netting, or turf reinforcement mat (TRM).

Check dams must be:

1. Installed after the application of erosion control blanket in the ditch or swale
2. Placed approximately perpendicular to the centerline of the ditch or drainage line
3. Installed with sufficient spillway depth to prevent flanking of concentrated flow around the ends of the check dam

11
Fiber rolls for check dams must be:

1. Fastened with rope and notched wood stakes.
2. Installed by driving stakes into the soil until the notch is even with the top of the fiber roll
3. Installed by lacing the rope between stakes and over the fiber roll. Knot the rope at each stake
4. Tightened by driving the stakes further into the soil forcing the fiber roll against the surface of the ditch or drainage line

**Maintenance**

12

Repair or replace check dam within 24 hours of discovering the damage or longer if allowed by the Engineer.

13

If your vehicles, equipment, or activities disturb or displace flared end section protection, repair check dam at your expense.

14

Maintain check dam in a manner that provides sediment holding capacity and reduces runoff velocities as follows:

19. Remove sediment from check dam when sediment is in excess of 1/3 the height of the fiber roll
20. Repair or adjust the fiber roll when rills or other evidence of concentrated runoff occur beneath the check dam
21. Repair or replace the fiber roll when it becomes split, torn, or unraveled
22. Add stakes when the fiber roll slumps or sags
23. Replace broken or split wood stakes
24. Remove sediment deposits, trash, and debris from check dam as needed or when directed by the Engineer. Trash and debris shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. If removed sediment is deposited within project limits, it must be stabilized and not exposed to erosion by wind or water

**MEASUREMENT AND PAYMENT**

15

Check dam is measured by the linear foot along the centerline of the check dams. Where fiber rolls are joined and overlapped, the overlap is measured as a single installed check dam.

16. **Do not "full comp" erosion control blanket, RECP, or TRM.**

The contract price paid per linear foot for check dam includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the check dams, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.