SPECIFICATIONS

BITUMINOUS SEAL COATS

VARIOUS LOCATIONS IN FRESNO COUNTY

BUDGET / ACCOUNT: 4510 / 7370



Department of Public Works and Planning

CONTRACT NUMBER 17-25-C



County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING STEVEN E. WHITE, DIRECTOR

March 26, 2018

Contract No. 17-25-C

ADDENDUM NO. 1 to the Bidding and Contract Documents for Bituminous Seal Coats Various Locations In Fresno County, revising the Bidding and Contract Documents as follows:

COVER PAGE

No changes

TABLE OF CONTENTS

No changes

NOTICE TO BIDDERS

DELETE the following text:

The work to be done consists, in general, of furnishing and placing screenings over asphaltic emulsion at various existing roads in Fresno County. The seal coat will be constructed on 29.4 miles of roadway on County roads. An additional 37.9 miles of County roads are included as additive bids. County forces will repair, trim, and blade heavy dirt deposits and vegetation from the existing surfacing in advance of construction.

REPLACE with the following text:

The work to be done consists, in general, of furnishing and placing screenings over asphaltic emulsion at various existing roads in Fresno County. The seal coat will be constructed on 29.4 miles of roadway on County roads. An additional 8.5 miles of County roads are included as additive bids. County forces will repair, trim, and blade heavy dirt deposits and vegetation from the existing surfacing in advance of construction.

SPECIAL PROVISIONS

No changes

PROPOSAL

No changes

AGREEMENT

No changes

Addendum No. 1 Contract No. 17-25-C

PROJECT DETAILS

No changes

PLANS

No changes

END OF ADDENDUM NO. 1

Please attach this Addendum to the inside cover of the Specifications booklet. If you have given the Bidding and Contract Documents to someone else, please forward this Addendum.

REGIST PROFESSIO EA. SI OAL No. 59670 Date Signed Exp. 12-31-19 CIVIL OF CALIFORNIA **Supervising Engineer:** Dale Siemer, PE 59670 FRESNO COUNTY Lic. Expiration: 12/31/19 **Department of Public Works and Planning** m/a 2220 Tulare Street, Seventh Floor Fresno, CA 93721-2106

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AGREEMENT

PROJECT: BITUMINOUS SEAL COATS

CONTRACT NUMBER: 17-25-C

Adopted by the Fresno County Board of Supervisors, _____, 2018

Sal Quintero, Chairman Andreas Borgeas, Vice Chairman Brian Pacheco Ernest Buddy Mendes Nathan Magsig 3rd District 2nd District 1st District 4th District 5th District

Jean Rousseau, County Administrative Officer

Steven E. White, Director Department of Public Works and Planning

PROFESSIONA REGISTERS OALE A. SIE No. 59670 Exp. 12-31-Date Signed: 3 26 B CIVIN ATE OF CALIFORNIE Supervising Engineer: Dale Siemer, PE C59670 FRESNO COUNTY Lic. Expiration: 12/31/19 Department of Public Works and Planning

m/a 2220 Tulare Street, Suite 720 Fresno, CA 93721-2106

Contract No. 17-25-C

BOARD OF SUPERVISORS COUNTY OF FRESNO STATE OF CALIFORNIA

NOTICE TO BIDDERS

Sealed proposals will be received at the Fresno County Department of Public Works and Planning (Department), Office of the Design Engineer, Seventh Floor, Fresno County Plaza Building, 2220 Tulare Street, Fresno, CA 93721 until

2:00 P.M., (1400 hours and 00 seconds) Tuesday, April 10, 2018

at which time the bidding will be closed. Promptly following the closing of the bidding all timely submitted bids will be publicly opened and read at the Department in said building, for construction in accordance with the project specifications therefor, to which special reference is made as follows:

BITUMINOUS SEAL COATS

Various Locations in Fresno County

CONTRACT NUMBER: 17-25-C

The work to be done consists, in general, of furnishing and placing screenings over asphaltic emulsion at various existing roads in Fresno County. The seal coat will be constructed on 29.4 miles of roadway on County roads. An additional 37.9 miles of County roads are included as additive bids. County forces will repair, trim, and blade heavy dirt deposits and vegetation from the existing surfacing in advance of construction.

The County of Fresno is committed to increasing the availability of employment and training opportunities, and requires that the Contractor and each subcontractor employed on this Project shall use their best efforts to ensure that thirty-three percent (33%) of apprentice hours are performed by qualified participants in state approved apprenticeship programs who also are current or former "Welfare-to-Work" participants in the CalWORKs program. Attention is directed to "Apprentices" in Section 7 of these special provisions.

Incentives whereby the Contractor or subcontractor receives partial reimbursement for the wages paid to apprentices who qualify may be available. The incentive program is administered by the County of Fresno, Department of Social Services, Employment Resource Center. For questions regarding the incentive program, contact the Employment Resource Center at (559) 600-5370.

Planholder and exchange/publication names may be obtained from the Fresno County website at http://www.co.fresno.ca.us/planholders.

Electronic copies, in ".pdf" file format, of the official project specifications, such additional supplemental project information as may be provided, are available to view, download, and print at http://www.co.fresno.ca.us/planholders.

Bid books, which contain bid proposal sheets necessary to submit a bid, may be obtained at no charge by sending a request to <u>DesignServices@co.fresno.ca.us</u>. Upon receipt of the request, a bid book will be mailed to the requestor via First Class United States Mail and the requestor will then be listed as a planholder for the project.

Project specifications will not be sold to prospective bidders in hardcopy format except upon special written request to DesignServices@co.fresno.ca.us. A payment to the Department in the amount of for each set of specifications.

A Summary of Bids and a list of subcontractors for the apparent low bidder will be posted at the above listed website, generally within 24 hours of the Bid Opening.

All questions regarding this project shall be in writing and shall be received by the Department of Public Works and Planning, Design Division, no later than 2:00 P.M. on the seventh (7th) calendar day before bid opening. Any questions received after this deadline will not receive a response unless the Department of Public Works and Planning elects to issue an addendum to revise the bid opening date. In the event that the bid opening date is revised, the deadline for questions will be extended to no later than 2:00 P.M. on the seventh (7th) calendar day before the revised bid opening date. Questions shall be submitted on the "CONTRACTOR REQUEST FOR CLARIFICATION" form provided in the "Project Details" section of these project specifications. Fax questions to (559) 455-4609; e-mail to DesignServices@co.fresno.ca.us or mail to:

County of Fresno Department of Public Works and Planning 2220 Tulare Street, Sixth Floor Fresno, Ca. 93721-2104

Any changes to, or clarification of, the project specifications shall be in the form of a written addendum issued to planholders of record. Questions that prompt a change or clarification shall be included in the addendum with the subsequent answer.

Any oral explanation or interpretations given to this project are not binding.

Bids shall be submitted in a sealed envelope addressed to the Department and labeled with the name of the bidder, the name of the project and the statement 'Do Not Open Until The Time Of Bid Opening.'

Bid security in the amount of ten (10) percent of the amount of the bid, and in the form of a bid bond issued by an admitted surety insurer licensed by the California Department of Insurance, cash, cashier's check or certified check shall accompany the bid. Bid security shall be made in favor of the County of Fresno.

No contract will be awarded to a contractor who has not been licensed in accordance with the provisions of the Contractors State License Law, California Business and Professions Code, Division 3, Chapter 9, as amended, or whose bid is not on the proposal form included in the contract document. A valid California Contractor's License, **Class A (General Engineering) or Class C-12 (Earthwork and Paving)** is required for this project.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at County of Fresno, Department of Public Works and Planning, 2220 Tulare Street, Sixth Floor, Fresno CA 93721-2104 and available from the California Department of Industrial Relations' Internet web site at http://www.dir.ca.gov/DLSR/PWD. Future effective general prevailing wage rates, which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Bids are required for the entire work described herein, including a bid for the base bid and a bid for each of the additive bids. The total amount of the base bid and additive bid is the cumulative sum of the bid amounts listed for the individual line items. Bids will be compared, for purposes of identifying the apparent low bidder for proposed award of the project, on the basis of the total of the base bid plus the total of all additive bids; provided however, that the ultimate scope of the project, as subsequently determined by the Board of Supervisors at the time of award, may or may not include all or any of the additive bids.

The successful bidder shall furnish a faithful performance bond in the amount of 100 percent of the contract amount and a payment bond in the amount of 100 percent of the contract amount. Each bond specified in this Notice (bid bond, faithful performance bond and payment bond) shall meet the requirements of all applicable statutes, including but not limited to those specified in Public Contract Code section 20129 and Civil Code section 3248.

Each bond specified in this Notice shall be issued by a surety company designated as an admitted surety insurer in good standing with and authorized to transact business in this state by the California Department of Insurance, and acceptable to the County of Fresno. Bidders are cautioned that representations made by surety companies will be verified with the California Department of Insurance. Additionally, the County of Fresno, in its discretion, when determining the sufficiency of a proposed surety company, may require the surety company to provide additional information supported by documentation. The County generally requires such information and documentation whenever the proposed surety company has either a Best's Key Rating Guide of less than **A** and a financial size designation of less than **VIII**. Provided, however, that the County expressly reserves its right to require all information and documentation to which the County is legally entitled from any proposed surety company.

Pursuant to Public Contract Code Section 22300, substitution of securities for any moneys withheld by the County of Fresno to ensure performance under the contract shall be permitted.

The Board of Supervisors reserves the right to reject any or all bids.

Board of Supervisors, County of Fresno

Jean Rousseau, County Administrative Officer

Bernice E. Seidel, Clerk of the Board

Issue Date: March 8, 2018

Bid Items and Applicable Sections

BITUMINOUS SEAL COATS VARIOUS LOCATIONS IN FRESNO COUNTY CONTRACT NO. 17-25-C

Bid Items and Applicable Sections

ITEM NO	ITEM DESCRIPTION	UNIT	SECTION
-	SUPPLEMENTAL WORK	\$	-
120100	TRAFFIC CONTROL SYSTEM	LS	12
120149	TEMPORARY PAVEMENT MARKING	LS	12
130100	JOB SITE MANAGEMENT	LS	13
130200	PREPARE WATER POLLUTION CONTROL PROGRAM	LS	13
370001	SAND COVER (SEAL)	TON	37
374493	POLYMER ASPHALTIC EMULSION (SEAL COAT)	TON	37
375001	SCREENINGS (3/8")	TON	37
374004	ASPHALTIC EMULSION (FLUSH COAT)	TON	37
810230	PAVEMENT MARKER (RETROREFLECTIVE)	EA	81
840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	84
840501	THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED)	LF	84
840515	THERMOPLASTIC PAVMENT MARKING	SF	84
846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	84
846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SF	84
999990	MOBILIZATION	LS	9

Special Provisions

Contract Number 17-25-C

SPECIAL PROVISIONS ORGANIZATION

Special provisions are under headings that correspond with the main-section headings of the *Standard Specifications*. A main-section heading is a heading shown in the table of contents of the *Standard Specifications*.

Each special provision begins with a revision clause that describes or introduces a revision to the *Standard Specifications* as revised by any revised standard specification.

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

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### DIVISION I GENERAL PROVISIONS 1 GENERAL

#### 1-1.01 GENERAL

#### Add to the beginning of Section 1-1.01:

The work is done in accordance with the 2015 Standard Specifications, 2015 Standard Plans and the following special provisions.

Where these special provisions indicate to replace, add to, delete, delete from, or otherwise modify a "section," or a portion thereof, the section or portion thereof to which such modification is to be applied is the section or portion thereof with the corresponding numbering in the 2015 Standard Specifications.

Except to the extent that they may conflict with these special provisions, revised standard specifications apply if included in the project details section of the book entitled "specifications."

Revised standard plans apply if listed on the "List of Revised Standard Plans," if any, in these special provisions; or if shown or referenced on the project plans or in the project details section of the book entitled "specifications."

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of such conflicting portions.

In case of conflict between applicable Revised Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of such conflicting portions.

#### Add to the end of section 1-1.01:

#### **Bid Items and Applicable Sections**

| Item    | Item description                                 | Applicable |
|---------|--------------------------------------------------|------------|
| Code    |                                                  | Section    |
| 090010A | SUPPLEMENTAL WORK                                | 9          |
| 090020A | SUPPLEMENTAL WORK (PAYMENT ADJUSTEMENT FOR PRICE | 9          |
|         | INDEX FLUCTUATIONS)                              |            |

#### Add to the 1st table of section 1-1.06:

| APCD | air pollution control district  |
|------|---------------------------------|
| AQMD | air quality management district |
| CISS | cast-in-steel shell             |
| CSL  | crosshole sonic logging         |
| GGL  | gamma-gamma logging             |

#### Add to section 1-1.06:

Abbreviations in the Bid Item List are also used in Proposal Sheet 2.

#### Replace the headings and paragraphs of Section 1-1.07 with:

#### 1-1.07 DEFINITIONS

#### 1-1.07A General

Interpret terms as defined in the Contract documents.

#### 1-1.07B Glossary

abandon: Render unserviceable in place.

acts of God: Acts of God as defined in Pub Cont Code § 7105.

**activity:** Task, event, or other project element on a schedule that contributes to completing the project. An activity has a description, start date, finish date, duration, and one or more logic ties.

adjust: Raise or lower a facility to match a new grade line.

- **aerially deposited lead:** Lead primarily from vehicle emissions deposited within unpaved areas or formerly unpaved areas.
- Authorized Facility Audit List: Caltrans-developed list of facilities. For the Authorized Facility Audit List, go the METS website.
- **authorized laboratory:** Independent testing laboratory (1) not employed or compensated by any subcontractor or subcontractor's affiliate providing other services for the Contract and (2) authorized by the Department.
- Authorized Material List: Caltrans-developed list of authorized materials. For the Authorized Material List go to the METS website.
- Authorized Material Source List: Caltrans-developed list of authorized source materials. For the Authorized Material Source List go to the METS website.
- **base:** Layer of specified material of planned thickness placed immediately below the pavement or surfacing.
- basement material: Material in an excavation or embankment under the lowest layer to be placed.

**bid item:** Work unit for which the Bidder provides a price.

**Bid Item List:** List of bid items, units of measure, and the associated quantities. The verified Bid Item List is the Bid Item List with verified prices. The Contract Proposal (Proposal 2) of Low Bidder at the Department's website is the verified Bid Item List. After contract award, interpret a reference to the Bid Item List as a reference to the verified Bid Item List.

borrow: Fill acquired from an excavation source outside the described cut area.

- 1. **local borrow:** Material obtained by widening cuts or excavating from sources outside the planned or authorized cross section on the job site. The location of the local borrow is described or designated by the Engineer.
- 2. imported borrow: Borrow that is not local borrow.

bridge: Structure that:

- 1. Has a bridge number
- 2. Carries a (1) utility, (2) railroad, or (3) vehicle, pedestrian, or other traffic over, under, or around obstructions or waterways
- **building-construction contract:** Contract that has *Building Construction* on the cover of the *Notice to Bidders and Special Provisions.*
- **California Test:** Caltrans-developed test for determining work quality. For California Tests, go to the METS website.

Caltrans: State of California Department of Transportation

- certificate of compliance: Certificate stating the material complies with the Contract.
- **Certified Industrial Hygienist:** Industrial hygienist certified in comprehensive practice by the American Board of Industrial Hygiene.
- change order work: Work described in a Change Order, including extra work and work described in the Contract as change order work.
- **closure:** Closure of a traffic lane or lanes, including shoulder, ramp, or connector lanes, within a single traffic control system.
- commercial quality: Quality meeting the best general practices.
- commercial source: Established business operating as a material source for the general public.
- **Contract:** Written and executed contract between the Department and the Contractor.
- Contract acceptance: Director's written acceptance of a completed Contract.
- Contract time: Number of original working days as adjusted by any time adjustment.
- **Contractor:** Person or business or its legal representative entering into a Contract with the Department for performance of the work.
- controlling activity: Construction activity that will extend the scheduled completion date if delayed.
- County: The County of Fresno
- critical path: Longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path extends the scheduled completion date.
- critical path method: Network-based planning technique using activity durations and relationships between activities to calculate a schedule for the entire project.

culvert: Structure other than a bridge that provides an opening under a roadway.

data date: Day after the date through which a schedule is current. Everything occurring earlier than the data date is as-built and everything on or after the data date is planned.

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

- 1. **business day:** Day on the calendar except a Saturday and a holiday.
- 2. **working day:** Time measure unit for work progress. A working day is any 24-consecutive-hour period except:

- 2.1. Saturday and a holiday.
- 2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
  - 2.2.1. Adverse weather-related conditions.
  - 2.2.2. Traffic maintenance under the Contract.
  - 2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
  - 2.2.4. Unanticipated event not caused by either party, such as:
    - 2.2.4.1. Act of God
    - 2.2.4.2. Act of a public enemy.
    - 2.2.4.3. Epidemic.
    - 2.2.4.4. Fire.
    - 2.2.4.5. Flood.
    - 2.2.4.6. Governor-declared state of emergency.
    - 2.2.4.7. Landslide.
    - 2.2.4.8. Quarantine restriction.
  - 2.2.5. Issue involving a third party, including:
    - 2.2.5.1. Industry or area-wide labor strike.
    - 2.2.5.2. Material shortage.
    - 2.2.5.3. Freight embargo.
    - 2.2.5.4. Jurisdictional requirement of a law enforcement agency.
    - 2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.
- 2.3. Day during a concurrent delay.

#### 3. original working days:

- 3.1. Working days to complete the work shown on the *Notice to Bidders* for a non-cost-plus-timebased bid
- 3.2. Working days bid to complete the work for a cost-plus-time-based bid
- Where working days is specified without the modifier *original* in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.
- **deduction:** Money permanently taken from a progress payment or the final payment. Deductions are cumulative and are not retentions under Pub Cont Code § 7107.

delay: Event that extends the completion of an activity.

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

3.3. Non–working day

Department: The Fresno County Board of Supervisors and its authorized representatives.

- District Office: County of Fresno Department of Public Works and Planning
- **detour:** Temporary route for traffic around a closed road part. A passageway through a job site is not a detour.
- Director: Department's Chairman
- disadvantaged business enterprise: Disadvantaged business enterprise as defined in 49 CFR 26.5.
- dispose of: Remove from the job site.
- divided highway: Highway with separated traveled ways for traffic, generally in opposite directions.
- **Engineer:** The County's Director of Public Works and Planning, acting through their authorized designees.
- early completion time: Difference in time between an early scheduled completion date and the work completion date.
- environmentally sensitive area: Area within or near construction limits where access is prohibited or limited to protect environmental resources.
- estimated cost: Estimated cost of the project as shown on the Notice to Bidders.
- extra work: Any work, desired or performed, but not included in the original Contract.
- federal-aid contract: Contract that has a federal-aid project number on the cover of the Notice to Bidders and Special Provisions.
- final pay item: Bid item whose q2uantity shown on the Bid Item List is the quantity paid.
- **finished grade:** Final surface of the completed facility. If the work under the Contract includes stage construction, the relation between the finished grade and the work under the Contract is shown.
- **fixed cost:** Labor, material, or equipment cost directly incurred by the Contractor as a result of performing or supplying a particular bid item that remains constant regardless of the item's quantity.
- float: Difference between the earliest and latest allowable start or finish times for an activity.
- 1. **Department-owned float:** Time saved on the critical path by actions of the Department. It is the last activity shown on the schedule before the scheduled completion date.
- **force account work:** Work ordered on a construction project without an existing agreement on its cost, and performed with the understanding that the contractor will bill the owner according to the cost of labor, materials, and equipment, plus a certain percentage for overhead and profit.
- grading plane: Basement material surface on which the lowest layer of subbase, base, pavement, surfacing, or other specified layer is placed.

highway: Whole right-of-way or area reserved for use in constructing the roadway and its appurtenances.

holiday: Holiday shown in the following table:

| Holidays                            |                            |  |
|-------------------------------------|----------------------------|--|
| Holiday                             | Date observed              |  |
| Every Sunday                        | Every Sunday               |  |
| New Year's Day                      | January 1 <sup>st</sup>    |  |
| Birthday of Martin Luther King, Jr. | 3rd Monday in January      |  |
| Presidents' Day                     | 3rd Monday in February     |  |
| Cesar Chavez Day                    | March 31 <sup>st</sup>     |  |
| Memorial Day                        | Last Monday in May         |  |
| Independence Day                    | July 4 <sup>th</sup>       |  |
| Labor Day                           | 1st Monday in September    |  |
| Veterans Day                        | November 11 <sup>th</sup>  |  |
| Thanksgiving Day                    | 4th Thursday in November   |  |
| Day after Thanksgiving Day          | Day after Thanksgiving Day |  |
| Christmas Day                       | December 25 <sup>th</sup>  |  |

If January 1st, March 31st, July 4th, November 11th, or December 25th fall on a Sunday, the Monday following is a holiday. If January 1st, March 31st, July 4th, November 11th, or December 25th fall on a Saturday, the preceding Friday is a holiday.

hours of darkness: Hours of darkness as defined in Veh Code § 280.

idle equipment: Equipment:

- 1. On the job site at the start of a delay
- 2. Idled because of the delay
- 3. Not operated during the delay
- **informal-bid contract:** Contract that has *Informal Bid Authorized by Pub Cont Code* § 10122 on the cover of the *Notice to Bidders and Special Provisions*.

job site: Area within the defined boundaries of a project.

Labor Surcharge and Equipment Rental Rates: Caltrans publication that lists labor surcharge and equipment rental rates.

landscaping: Practice of a landscaping contractor under 16 CA Code of Regs § 832.27.

material: Any product or substance specified for use in the construction of a project.

#### material shortage:

- 1. Shortage of raw or produced material that is area-wide and caused by an unusual market condition except if any of the following occurs:
  - 1.1. Shortage relates to a produced, nonstandard material
  - 1.2. Supplier's and the Contractor's priority for filling an order differs
  - 1.3. Event outside the United States for a material produced outside the United States
- 2. Unavailability of water that delays a controlling activity
- **material source facility audit:** Self-audit and a Caltrans audit evaluating a facility's capability to consistently produce materials that comply with Caltrans standards.

median: Portion of a divided highway separating the traveled ways including inside shoulders.

- **milestone:** Event activity that has zero duration and is typically used to represent the start or end of a certain stage of the project.
- **mobilization:** Preparatory work that must be performed or costs incurred before starting work on the various items on the job site (Pub Cont Code § 10104).

modify: Add to or subtract from an appurtenant part.

- **narrative report:** Document submitted with each schedule that discusses topics related to project progress and scheduling.
- **near critical path:** Chain of activities with total float exceeding that of the critical path but having not more than 10 working days of total float.

obliterate: Place an earth cover over or root, plow, pulverize, or scarify.

Office engineer: The Director of Public Works and Planning for the County of Fresno

pavement: Uppermost layer of material placed on a traveled way or shoulder.

plans: Standard plans, revised standard plans, and project plans.

- 1. standard plans: Drawings standard to Department construction projects.
- 2. revised standard plans: New or revised standard plans.
- 3. project plans: Drawings specific to the project, including authorized shop drawings.

plant establishment period: Number of days shown on the Notice to Bidders for plant establishment.

**quality characteristic:** Characteristic of a material that is measured to determine conformance with a given requirement.

quality control plan: Contractor's plan to ensure QC.

reconstruct: Remove and disassemble and construct again at an existing or new location.

relocate: Remove and install or place in a new location.

remove: Remove and dispose of.

reset: Remove and install or place laterally at the same station location.

**roadbed:** Roadway portion extending from the curb line to curb line or the shoulder line to shoulder line. A divided highway has 2 roadbeds.

roadside: Area between the outside shoulder edge and the right-of-way limits.

**roadway:** Portion of the highway within the outside lines of curbs, sidewalks, slopes, ditches, channels, or waterways. A roadway includes the structures and features necessary for safety, protection of facilities, and drainage.

salvage: Remove, clean, and haul to a specified location.

#### schedule:

- 1. **baseline schedule:** Initial schedule showing the original work plan starting on the date of Contract approval. This schedule shows no completed work to date and no negative float or negative lag to any activity.
- 2. **revised schedule:** Schedule that incorporates a proposed or past change to logic or activity durations.
- 3. **updated schedule:** Current schedule developed from the accepted baseline and any subsequent accepted updated or revised schedules through regular monthly review to incorporate actual past progress.

scheduled completion date: Planned work completion date shown on the current schedule.

**shoulder:** Roadway portion contiguous with the traveled way for accommodation of a stopped vehicle, emergency use, and lateral support of base and surface courses.

**small tool:** Tool or piece of equipment not listed in Labor Surcharge and Equipment Rental Rates that has a replacement value of \$500 or less.

specifications: Standard specifications, revised standard specifications, and special provisions.

- 1. **standard specifications:** Specifications standard to Department construction projects. These specifications are in a book titled *Standard Specifications*.
- 2. **revised standard specifications:** New or revised standard specifications. These specifications are in a section titled *Revised Standard Specifications* of a book titled *Notice to Bidders and Special Provisions*.
- 3. **special provisions:** Specifications specific to the project. These specifications are in a section titled *Special Provisions* of a book titled *Notice to Bidders and Special Provisions*.
- State: State of California, including its agencies, departments or divisions whose conduct or action is related to the work.

Structure Design: Offices of Structure Design of the Department of Transportation.

subbase: Layer of material between a base and the basement material.

**subgrade:** Roadbed portion on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

#### submittal:

- 1. **action submittal:** Written and graphic information and samples that require the Department's response.
- 2. informational submittal: Written information that does not require the Department's response.
- **substantial defects:** Defects plainly seen as damaged, displaced, or missing parts or improper functioning of materials, parts, equipment, or systems.
- **substructure:** Bridge parts below the bridge seats, pier tops, and haunches for rigid-framed bridges or spring lines for arched bridges; includes abutment backwalls, abutment parapets, and wingwalls.

superstructure: Bridge parts except the substructure.

- **supplemental project information:** Information relevant to the project, specified as supplemental project information, and made available to bidders.
- surfacing: Uppermost layer of material placed on a traveled way or shoulders; pavement.
- time impact analysis: Analysis using a CPM schedule developed specifically to demonstrate the effect a proposed or past change or delay has on the current scheduled completion date.
- **time-scaled network diagram:** Graphic depiction of a CPM schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.
- total bid: Sum of the item totals as verified by the Department; original Contract price.
- **total float:** Amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.
- traffic: Pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.

traffic lane: Portion of traveled way used for the movement of a single line of vehicles.

**traveled way:** Portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.

tunnel: Tunnel as defined in 8 CA Code of Regs § 8405 et seq.

- **unauthorized work:** Work performed beyond the lines and grades described in the Contract or established by the Engineer or extra work performed without Department authorization.
- **unsuitable material:** Material encountered below the natural ground surface in embankment areas or below the grading plane in excavation areas that the Engineer determines to be in any of the following conditions:
- 1. Of such unstable nature that it cannot be compacted to the specified density using ordinary methods at optimum moisture content.
- 2. Too wet to be properly compacted and cannot be dried before incorporating it into the work. Excessive moisture alone is not sufficient cause for determining that the material is unsuitable.
- 3. Inappropriate for the planned use.

withhold: Money temporarily or permanently taken from a progress payment.

work: Resources and activities required for Contract acceptance, including labor, materials, equipment, and the created product.

work plan: Detailed formulation of a program of action.

work zone: Area of a highway with construction, maintenance, or utility work activities.

#### 1-1.08 DISTRICTS

#### Replace the first sentence in Section 1.08 with the following:

Caltrans' district composition and office addresses are as shown in the following table:

#### Add to the end of Section 1-1.09

This project is not in a freeze-thaw area.

#### Replace the headings and paragraphs of Section 1-1.10 with:

#### **1-1.10 PAVEMENT CLIMATE REGIONS**

To help account for the effects of various climatic conditions on pavement performance, the State has been divided into 9 climate regions. Portions of the project are located in the Inland Valley climate region and a portion is located in the Low Mountain climate region.

#### Replace the headings and paragraphs of Section 1-1.11 with: 1-1.11 WEBSITES, ADDRESSES, AND TELEPHONE NUMBERS

#### Websites, Addresses, and Telephone Numbers

| Reference or      |                                   |                                            |                 |
|-------------------|-----------------------------------|--------------------------------------------|-----------------|
| agency or         |                                   |                                            |                 |
| department unit   | Website                           | Address                                    | Telephone no.   |
| Authorized        |                                   |                                            |                 |
| Material Lists    | http://www.dot.ca.gov/hg/e        |                                            |                 |
| Authorized        | sc/approved products list         |                                            |                 |
| Material Source   |                                   |                                            |                 |
| Lists             |                                   |                                            |                 |
| CA Unified        |                                   |                                            |                 |
|                   | <u>nttp://www.dot.ca.gov/nq/b</u> |                                            |                 |
| Program S list of | ep/ina_centilea.ntm               |                                            |                 |
| California        |                                   |                                            |                 |
|                   | http://www.dot.ca.gov             |                                            |                 |
| 10100             |                                   | 2220 Tulare Street                         | (559) 600-      |
| Department        | http://www.co.frespo.ca.us        | Design Division – Sixth Floor              | 4501 or (559)   |
| Department        |                                   | Fresno CA 93721                            | 600-4528        |
| Department of     |                                   |                                            |                 |
| Conservation.     | http://www.conservation.c         |                                            |                 |
| Office of Mine    | a.gov/omr/                        |                                            |                 |
| Reclamation       |                                   |                                            |                 |
| Department of     |                                   | 455 GOLDEN GATE AVE                        |                 |
| Industrial        | http://www.dir.ca.gov             | SAN FRANCISCO CA 94102                     |                 |
| Relations         |                                   |                                            |                 |
| Design            | http://www.co.fresno.ca.us        | 2220 TULARE STREET; 7 <sup>TH</sup> FLOOR; | Tel: (559) 600- |
| Services -        | /departmentpage.aspx?id=          | FRESNO, CA 93721                           | 4528            |
| Contract          | <u>5818</u>                       |                                            | Fax:(559) 600-  |
| Administration,   |                                   |                                            | 4399 Email:     |
| Plannoiders,      |                                   |                                            |                 |
| BIG Results       |                                   |                                            | s@co.iresno.c   |
|                   |                                   |                                            | a.us            |
|                   |                                   | PAYMENT AND INFORMATION                    |                 |
| Division of       |                                   | UNIT                                       |                 |
| Accounting.       |                                   | OFFICE OF EXTERNAL ACCOUNTS                |                 |
| Office of         | http://www.dot.ca.gov/hq/a        | PAYABLE                                    | (916) 227-      |
| External          | sc/oap/payments/contact.n         | DIVISION OF ACCOUNTING                     | 9013            |
| Accounts          |                                   | DEPARTMENT OF                              |                 |
| Payable           |                                   | TRANSPORTATION                             |                 |
|                   |                                   | P.O. BOX 168043                            |                 |
|                   |                                   | SACRAMENTO CA 95816-8043                   |                 |
| Division of       | http://www.dot.ca.gov/hq/c        |                                            |                 |
| Construction      | onstruc/                          |                                            |                 |
|                   |                                   |                                            |                 |
| Geotechnical      | http://www.dot.ca.gov/hq/e        |                                            | (916) 227-      |
| Services          | sc/geotech                        |                                            | 7000            |
|                   |                                   | SACRAMENTO CA 95819-4612                   |                 |
|                   |                                   |                                            |                 |
|                   |                                   | TESTING SERVICES                           |                 |
| METO              | http://www.dot.ca.gov/hg/e        | DEPARTMENT OF                              | (916) 227-      |
| INFIS             | sc/Translab/                      | TRANSPORTATION                             | ` 7Ó00          |
|                   |                                   | 5900 FOLSOM BLVD                           |                 |
|                   |                                   | SACRAMENTO CA 95819-4612                   |                 |

| MPQP                                                 | http://www.dot.ca.gov/man<br>uals.htm |                                                                                                                                            |                    |
|------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Office Engineer                                      |                                       | MSC 43<br>OFFICE ENGINEER<br>DEPARTMENT OF<br>TRANSPORTATION<br>1727 30TH ST<br>SACRAMENTO CA 95816-7005                                   | (916) 227-<br>6299 |
| Offices of<br>Structure<br>Design,<br>Documents Unit |                                       | MSC 9-4/4I<br>DOCUMENTS UNIT OFFICES OF<br>STRUCTURE DESIGN<br>DEPARTMENT OF<br>TRANSPORTATION<br>1801 30TH ST<br>SACRAMENTO CA 95816-7006 | (916) 227-<br>0716 |
| Publication<br>Distribution Unit                     |                                       | PUBLICATION UNIT<br>DEPARTMENT OF<br>TRANSPORTATION<br>1900 ROYAL OAKS DR<br>SACRAMENTO CA 95815-3800                                      |                    |

#### Replace the headings and paragraphs of Section 1-1.12 with the following:

#### 1-1.12 MISCELLANY

Make checks and bonds payable to the Fresno County Director of Department of Public Works and Planning.

#### 2 **BIDDING**

#### Replace the headings and paragraphs of Section 2 with the following:

#### 2-1.01 GENERAL

Section 2 includes specifications related to bid eligibility and the bidding process.

#### 2-1.02 BID INELIGIBILITY

A firm that has provided architectural or engineering services to the Department for this contract before bid submittal for this contract is prohibited from any of the following:

- 1. Submitting a bid
- 2. Subcontracting for a part of the work
- 3. Supplying materials

#### 2-1.03 CONTRACTOR REGISTRATION

No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

#### 2-1.04-2-1.05 RESERVED

#### 2-1.06 BID DOCUMENTS

#### 2-1.06A General

The *Bid* book includes bid forms and certifications and may be requested from Design Services.

The Notice to Bidders and Special Provisions includes the Notice to Bidders, revised standard specifications, project details, and special provisions.

The Notice to Bidders and Special Provisions, project plans, and any addenda to these documents may be accessed at Design Services.

The Standard Specifications and Standard Plans may be purchased at the Publication Distribution Unit.

#### 2-1.06B Supplemental Project Information

The Department makes the following supplemental project information available:

#### Supplemental Project Information

| Means                       | Description         |
|-----------------------------|---------------------|
| Included in Project Details | Encroachment permit |

#### 2-1.06C-2-1.06D Reserved

#### 2-1.07 JOB SITE AND DOCUMENT EXAMINATION

Examine the job site and bid documents. Notify the Department of apparent errors and patent ambiguities in the plans, specifications, and Bid Item List. Failure to do so may result in rejection of a bid or rescission of an award.

Bid submission is your acknowledgment that you have examined the job site and bid documents and are satisfied with:

- 1. General and local conditions to be encountered
- 2. Character, quality, and scope of work to be performed
- 3. Quantities of materials to be furnished
- 4. Character, quality, and quantity of surface and subsurface materials or obstacles
- 5. Requirements of the contract

#### 2-1.08 RESERVED

#### 2-1.09 BID ITEM LIST

Submit a bid based on the bid item quantities the Department shows on Proposal 2.

#### 2-1.10 SUBCONTRACTOR LIST

On the Subcontractor List form, list each subcontractor to perform work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.).

For each subcontractor listed, the Subcontractor List form must show:

- 1. Business name and the location of its place of business.
- 2. California contractor license number for a non-federal-aid contract.
- 3. Public works contractor registration number.
- 4. Portion of work it will perform. Show the portion of the work by:
  - 4.1. Bid item numbers for the subcontracted work
  - 4.2. Percentage of the subcontracted work for each bid item listed
  - 4.3. Description of the subcontracted work if the percentage of the bid item listed is less than 100 percent

#### 2-1.13-2-1.30 RESERVED

#### 2-1.31 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

You may opt out of the payment adjustments for price index fluctuations specified in section 9-1.07. To opt out, submit a completed Opt Out of Payment Adjustments for Price Index Fluctuations form under section 2-1.33.

#### 2-1.32 RESERVED

#### 2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL 2-1.33A General

Complete forms in the *Bid* book.

Submit your bid:

- 1. Under sealed cover
- 2. Marked as a bid
- 3. Identifying the contract number and the bid opening date

Certain bid forms must be submitted with the bid and properly executed.

Certain other forms and information must be submitted either with the bid or within the prescribed period after bid opening as specified elsewhere in these special provisions.

Failure to submit the forms and information as specified results in a nonresponsive bid.

If an agent other than the authorized corporation officer or a partnership member signs the bid, file a Power of Attorney with the Department either before opening bids or with the bid. Otherwise, the bid may be nonresponsive.

#### 2-1.33B Bid Item List and Bid Comparison

Submit a bid based on the bid item quantities the Department shows on Proposal 2. Bids will be evaluated and the low bidder determined as indicated in the *Notice to Bidders*.

#### 2-1.33C Bid Document Completion

Proposal sheets are identified by title and by the letter "P" followed by the number assigned to the proposal sheet in question. Proposal sheets are included in the *Bid Book*.

#### 2-1.33C(1) Proposal 1 - Proposal to the Board of Supervisors of Fresno County

#### 2-1.33C(2) Proposal 2 - Bid Proposal Sheet

One or more sheet(s) upon which the bidder completes the bid.

Fill out completely including a unit price and total for each unit price-based item and a total for each lump sum item.

Do not make any additions such as "plus tax", "plus freight", or conditions such as "less 2% if paid by 15th".

Use ink or typewriter.

#### 2-1.33C(3) Proposal 3 - Evaluation of Bid Proposal Sheet

Describes how inconsistences and irregularities are evaluated and corrected when Design Services reviews the Bid Sheet.

#### 2-1.33C(4) Proposal 4 - Bid Security and Signature

Submit one of the following forms of bidder's security equal to at least 10 percent of the bid:

- Cash
- Cashier's check
- Certified check

• Signed bidder's bond by an admitted surety insurer

Indicate type of bid security provided.

- Cash Acceptable but not recommended. Cash is deposited in a clearing account and is returned to bidders by County warrant. This process may take several weeks.
- Cashier's or Certified Checks. This type of security is held until the bid is no longer under consideration. If submitted by a potential awardee, they will be returned when the contract is fully executed by the bidder and bonds and insurance have been approved.
- Bid Bonds Must be signed by the bidder and by the attorney-in-fact for the bonding company. Provide notarized signature of attorney-in-fact accompanied by bonding company's affidavit authorizing attorney-in-fact to execute bonds. An unsigned bid bond will be cause for rejection.

Provide contractor's license information.

State business name and if business is a:

- Corporation list officers
- Partnership list partners
- Joint Venture list members; if members are corporations or partnerships, list their officers or partners.
- Individual list Owner's name and firm name style

Signature of Bidder - the following lists types of companies and corresponding authorized signers.

- Corporation by an officer
- Partnership by a partner
- Joint Venture by a member
- Individual by the Owner

If signature is by a Branch Manager, Estimator, Agent, etc., the bid must be accompanied by a power of attorney authorizing the individual to sign the bid in question or to sign bids more generally, otherwise the bid may be rejected.

Business Address - Firm's Street Address

Mailing Address - P.O. Box or Street Address

Complete, sign, and return with bid.

#### 2-1.33C(5) Proposal 5 - Noncollusion Affidavit

Must be completed, signed, and returned with bid.

#### 2-1.33C(6) Proposal 6 - Public Contract Code Section 10285.1 Statement

Check "has" or "has not" in accordance with instructions on form, return with completed for with bid. Note that signing the bid constitutes signing this statement.

## 2-1.33C(7) Proposal 7 - Public Contract Code Section 10162 Questionnaire And Public Contract Code 10232 Statement

Check: "yes" or "no" accordance with instructions on form, include explanation if "yes" is checked. Return completed form with bid. Note that signing the bid constitutes signing this questionnaire and statement.

#### 2-1.33C(8) Proposal 8(a) through Proposal 8(f) - Subcontractors

Sheet(s) upon which bidders list subcontractors. List each subcontractor to perform work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.).

The *Subcontractor List* submitted with the bid must show the name, location of business, work portions to be performed, and the contractor's license number for each subcontractor listed.

- Use subcontractor's business name style as registered with the License Board.
- Specify the city in which the subcontractor's business is located and the state if other than California.
- Description of the work to be performed by the subcontractor. Indicate with bid item numbers from the bid sheet and/or work descriptions similar to those on bid sheet.
- List license number and Department of Industrial Relations registration number for each subcontractor.

Upon request from Design Services, provide the following additional information within 24 hours of bid opening if not included on the *Subcontractor List* submitted with the bid:

- Complete physical address for each subcontractor listed.
- Percentage of the total bid or dollar amount associated with each subcontractor listed.

#### 2-1.33C(15) Proposal 15 - Opt out of payment adjustments for price index fluctuations

You may opt out of the payment adjustments for price index fluctuations specified in section 9-1.07. To opt out, submit a completed *Opt Out of Payment Adjustments for Price Index Fluctuations* form with your bid.

#### 2-1.33C(16) Proposal 16 - Guaranty

Does not need to be signed with the bid. Part of the contract which must be signed by the contractor when contract is executed.

#### 2-1.34 BIDDER'S SECURITY

Submit one of the following forms of bidder's security equal to at least 10 percent of the bid:

- 1. Cash
- 2. Cashier's check
- 3. Certified check
- 4. Signed bidder's bond by an admitted surety insurer

Submit cash, cashier's check, certified check, or bidder's bond with your bid.

#### 2-1.35-2-1.39 RESERVED

#### 2-1.40 BID WITHDRAWAL

- 1. An authorized agent may withdraw a bid before the bid opening date and time by submitting a written bid withdrawal request at the location where the bid was submitted. Withdrawing a bid does not prevent you from submitting a new bid. An authorized agent is an individual authorized to submit a bid.
- 2. After the bid opening time, you cannot withdraw a bid.

#### 2-1.41-2-1.42 RESERVED

#### 2-1.43 BID OPENING

The Department publicly opens and reads bids at the time and place shown on the Notice to Bidders.

#### 2-1.44-2-1.45 RESERVED

#### 2-1.46 DEPARTMENT'S DECISION ON BID

The Department's decision on the bid amount is final.

The Department may reject:

- 1. All bids
- 2. A nonresponsive bid

#### 2-1.47 BID RELIEF

The Department may grant bid relief under Pub Cont Code § 5100 et seq. Submit any request for bid relief to Design Services.

#### 2-1.48 RESERVED

#### 2-1.49 SUBMITTAL FAILURE HISTORY

The Department considers a bidder's past failure to submit documents required after bid opening in determining a bidder's responsibility.

#### 2-1.51 DISCLOSURE OF SELF-DEALING TRANSACTIONS

This provision is only applicable if the contractor is operating as a corporation (a for-profit or non-profit corporation) or if during the term of this agreement, the contractor changes its status to operate as a corporation.

Members of the contractor's Board of Directors shall disclose any self-dealing transactions that they are a party to while contractor is providing goods or performing services under this agreement. A self-dealing transaction shall mean a transaction to which the contractor is a party and in which one or more of its directors has a material financial interest. Members of the Board of Directors shall disclose any self-dealing transactions that they are a party to by completing and signing a Self-Dealing Transaction Disclosure Form which is included in *Project Details* of these special provisions.

In the event that the Contractor (to whom the project is awarded) is operating as a corporation or incorporates during the course of the construction contract, and any member of its board of directors is engaged or intends to become engaged in self-dealing transaction(s), each member of its board of directors who is engaged or intends to become engaged in a self-dealing transaction or transactions must complete and submit to the County a completed Self-Dealing Transaction Disclosure Form (in Project Details) for each such transaction prior to engaging therein or immediately thereafter.

^^^^

#### **3 CONTRACT AWARD AND EXECUTION**

#### Replace the headings and paragraphs of Section 3 with:

#### 3-1.01 GENERAL

Section 3 includes specifications related to contract award and execution.

#### 3-1.02 CONSIDERATION OF BIDS

#### 3-1.02A General

Bids will be compared on the basis listed in the Notice to Bidders.

#### 3-1.02B Tied Bids

The Department breaks a tied bid with a coin toss:

#### 3-1.03 CONTRACTOR REGISTRATION

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

#### 3-1.04 CONTRACT AWARD

Submit any bid protest to Design Services.

If the Department awards the contract, the award is made to the lowest responsible bidder within 54 calendar days after bid opening.

The Department may extend the specified award period if the Bidder agrees.

You may request to extend the award period by faxing a request to Design Services before 4:00 p.m. on or before the last day of the award period. If you do not make this request, after the specified award period:

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

#### 3-1.05 CONTRACT BONDS (PUB CONT CODE §§ 10221 AND 10222)

The successful bidder must furnish 2 bonds conforming to the requirements in the *Agreement* of these special provisions.

#### 3-1.06 CONTRACTOR LICENSE

For a federal-aid contract, the Contractor must be properly licensed as a contractor from contract award through Contract acceptance (Pub Cont Code § 10164).

For a non-federal-aid contract:

- 1. Contractor must be properly licensed as a contractor from bid opening through Contract acceptance (Bus & Prof Code § 7028.15)
- 2. Joint venture bidders must obtain a joint venture license before contract award (Bus & Prof Code § 7029.1)

#### 3-1.07 INSURANCE POLICIES

The successful bidder must submit copies of its insurance policies conforming to the requirements in the *Agreement* of these special provisions.

#### 3-1.08 -3-1.10 RESERVED

#### 3-1.11 PAYEE DATA RECORD

Complete and deliver to the Engineer a Payee Data Record form when requested by the Engineer.

#### 3-1.12 RESERVED

#### 3-1.14-3-1.17 RESERVED

3-1.18 CONTRACT EXECUTION

The successful bidder must sign the Agreement.

Deliver to Design Services:

- 1. Signed Agreement including the attached form FHWA-1273
- 2. Contract bonds
- 3. Documents identified in section 3-1.07
- 4. For a federal-aid contract, Local Agency Bidder DBE Information form

Design Services must receive these documents before the 10th business day after the bidder receives the contract.

The bidder's security may be forfeited for failure to execute the contract within the time specified (Pub Cont Code §§ 10181, 10182, and 10183).

#### 3-1.19 BIDDERS' SECURITIES

The Department keeps the securities of the 1st, 2nd, and 3rd low bidders until the contract has been executed. The other bidders' securities, other than bidders' bonds, are returned upon determination of the 1st, 2nd, and 3rd low bidders, and their bidders' bonds are of no further effect (Pub Cont Code § 10184).

#### ^^^^

#### **4 SCOPE OF WORK**

#### Replace Section 4-1.02 with:

#### 4-1.02 INTENT

The Contract intent is to provide for work completion using the best general practices.

Nothing in the specifications, special provisions, Standard Specifications, or in any other Contract document voids the Contractor's public safety responsibilities.

#### Replace the paragraphs of Section 4-1.07C with the following:

#### 4-1.07C Reserved

#### Replace Section 4-1.13 with:

#### 4-1.13 CLEANUP

Before final inspection, leave the job site neat and presentable and dispose of:

- 1. Rubbish
- 2. Excess materials
- 3. Falsework
- 4. Temporary structures
- 5. Equipment

Remove warning, regulatory, and guide signs when directed by the Engineer.

#### ^^^^

#### 5 CONTROL OF WORK

#### Delete the 9<sup>th</sup> Paragraph of Section 5-1.01 Add the following before the last sentence in Section 5-1.02

Caltrans Standard Plans, City of Fresno Standard Drawings, and any other other-agency Standard Drawings included in the "Project Details" section of the book entitled "specifications" have the same ranking as Standard Plans."

All other drawings in the "Project Details" section of the book entitled "specifications" have the same ranking as Project Plans.

Tables and other documents in the "Project Details" section of the book entitled "specifications" have the same ranking as Special Provisions. If a portion of a document in the Project Details section conflicts with the Special Provisions, the Special Provisions shall prevail.
### Replace the headings and paragraphs of section 5-1.09 with:

#### 5-1.09 RESERVED

### Replace Section 5-1.12 with:

## 5-1.12 ASSIGNMENT

No third-party agreement relieves you or your surety of the responsibility to complete the work. Do not sell, transfer, or otherwise dispose of any Contract part without prior written consent from the Department.

If you assign the right to receive Contract payments, the Engineer accepts the assignment upon the Engineer's receipt of a notice. Assigned payments remain subject to deductions and withholds described in the Contract. The Department may use withheld payments for work completion whether payments are assigned or not.

A pending or disapproved request for assignment does not relieve you of the responsibility to commence and pursue work timely and in strict accordance with contract documents.

### Replace the headings and paragraphs of section 5-1.13C with:

### 5-1.13C RESERVED

#### Replace the headings and paragraphs of section 5-1.13D with:

### 5-1.13D RESERVED

### Replace the paragraphs of section 5-1.20B(4) with:

## 5-1.20B(4) Contractor–Property Owner Agreement

Before procuring material from or disposing or stockpiling of material on non-highway property:

- 1. Provide proof that the property where materials are to be stockpiled or equipment parked/stored is appropriately zoned and/or permitted for the use proposed by the Contractor.
- 2. Obtain written authorization from each and every owner of the property where materials are to be stockpiled or equipment parked/stored.
- 3. Provide proof that the signor(s) of the authorization are the owners of the property.
- 4. Provide an executed release from the property owner(s) absolving the Department from any and all responsibility in connection with the stockpiling of materials or parking/storage of equipment on said property.
- 5. Obtain written permission from the Engineer to stockpile materials or park/store equipment at the location designated in said authorization.

Before Contract acceptance, submit a document signed by the owner of the material source or disposal site stating that the Contractor has complied with the Contractor-owner agreement.

Failure by the Contractor to provide written authorization shall result in the withholding of all funds due to the Contractor until said authorization is received by the County.

#### Replace the paragraph of section 5-1.20C with:

#### 5-1.20C Railroad Relations

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

#### Replace the paragraphs of section 5-1.23A with:

#### 5-1.23A General

Section 5-1.23 includes specifications for action and informational submittals.

Any submittal not specified as an informational submittal is an action submittal.

Submit action and informational submittals to the Engineer. Unless otherwise specified in these Specifications, submittals shall be provided via email in .pdf format.

Each submittal must have a cover sheet that must include:

- 1. Contract number
- 2. Project Name
- 3. Date
- 4. Submittals (and resubmittals if applicable) must be numbered sequentially
- 5. Structure number if applicable
- 6. Contractor
- 7. Person responsible for submitting the submittal
- 8. Signature of Contractor's representative sending submittal
- 9. Section number and/or item submittal is referencing
- 10. Pages of submittal, excluding cover sheet

The Department rejects a submittal if it has any error or omission.

If the last day for submitting a document falls on a Saturday or holiday, it may be submitted on the next business day with the same effect as if it had been submitted on the day specified.

Documents must be submitted in the English language.

Convert documents to US customary units.

### Replace Section 5-1.26 with:

## 5-1.26 CONSTRUCTION SURVEYS

The Engineer places stakes and/or marks as the Engineer determines to be necessary to establish the lines and grades required for the work.

Submit your request for Engineer-furnished stakes:

- 1 Once staking area is ready for stakes
- 2. On a Request for Construction Stakes form

After your submittal, the Engineer starts staking within 2 working days.

Preserve stakes and marks placed by the Engineer. If the stakes or marks are destroyed, the Engineer replaces them at the Engineer's earliest convenience and deducts the cost.

#### Replace Section 5-1.27E with:

## 5-1.27E CHANGE ORDER BILLS

Maintain separate records for change order work costs.

## 5-1.32 AREAS FOR USE

Occupy the highway only for purposes necessary to perform the work.

Defend, indemnify, and hold the Department harmless to the same extent as under section 7-1.05.

The Department does not allow temporary residences within the highway.

^^^^

## 6 CONTROL OF MATERIALS

Replace section 6-1.05 with:

### 6-1.05 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

Unless substitution is expressly precluded in the special provisions, a reference to a specific brand or trade name establishes a quality standard and is not intended to limit competition. Unless the Department has made a public interest finding expressly authorizing sole source procurement of a particular item, you may use a product that is equal to or better than the specified brand or trade name if authorized.

Submit a substitution request with a time period that:

- 1. Follows Contract award
- 2. Allows 30 days for review
- 3. Causes no delay

Include substantiating data with the substitution request that proves that substitution:

- 1. Causes no delay
- 2. Is of equal or better quality and suitability

If the special provisions disallow substitution of a particular item, provide the specified item and do not propose substitution.

#### ~~~~~

## 7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

#### Replace the 2<sup>nd</sup> Paragraph of Section 7-1.02K(2) with:

The general prevailing wage rates and any applicable changes to these wage rates are available:

- 1. From Design Services
- 2. From the Department of Industrial Relations' Web site

#### Replace section 7-1.02K(3) with:

04-22-16

Keep accurate payroll records.

Submit a copy of your certified payroll records, weekly, including those of subcontractors. Include:

- 1. Each employee's:
  - 1.1. Full name
  - 1.2. Address
  - 1.3. Social security number
  - 1.4. Work classification
  - 1.5. Straight time and overtime hours worked each day and week
  - 1.6. Actual wages paid for each day to each:
    - 1.6.1. Journeyman
    - 1.6.2. Apprentice
    - 1.6.3. Worker
    - 1.6.4. Other employee you employ for the work
  - 1.7. Pay rate
  - 1.8. Itemized deductions made
  - 1.9. Check number issued
- 2. Apprentices and the apprentice-to-journeyman ratio

Each certified payroll record must include a Statement of Compliance form signed under penalty of perjury that declares:

- 1. Information contained in the payroll record is true, correct, and complete
- 2. Employer has complied with the requirements of sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project
- 3. Wage rates paid are at least those required by the Contract

Submitted certified payrolls for hauling and delivering ready-mixed concrete must be accompanied by a written time record. The time record must include:

- 1. Truck driver's full name and address
- 2. Name and address of the factory or batching plant
- 3. Time the concrete was loaded at the factory or batching plant
- 4. Time the truck returned to the factory or batching plant
- 5. Truck driver's signature certifying under penalty of perjury that the information contained in this written time record is true and correct

Make certified payroll records available for inspection at all reasonable hours at your main office on the following basis:

- 1. Upon the employee's request or upon request of the employee's authorized representative, make available for inspection a certified copy of the employee's payroll record.
- Refer the public's requests for certified payroll records to the Department. Upon the public's request, the Department makes available for inspection or furnishes copies of your certified payroll records. Do not give the public access to the records at your main office.

Make all payroll records available for inspection and copying or furnish a copy upon request of a representative of the:

- 1. Department
- 2. Division of Labor Standards Enforcement of the Department of Industrial Relations
- 3. Division of Apprenticeship Standards of the Department of Industrial Relations

Furnish the Department the location of the records. Include the street address, city, and county. Furnish the Department a notification of a location and address change within 5 business days of the change.

Comply with a request for the records within 10 days after you receive a written request. If you do not comply within this period, the Department withholds from progress payments a \$100 penalty for each day or part of a day for each worker until you comply. You are not assessed this penalty for a subcontractor's failure to comply with Labor Code § 1776.

The Department withholds from progress payments for delinquent or inadequate records (Labor Code § 1771.5). If you have not submitted an adequate record by the month's 15th day for the period ending on or before the 1st of that month, the Department withholds up to 10 percent of the monthly progress estimate, exclusive of mobilization. The Department does not withhold more than \$10,000 or less than \$1,000.

#### 7-1.02K(4)i Apprenticeship Requirements for non-Federal Projects

A. Pursuant to Sections 1770-1780 of the Labor Code of the State of California, the Director of the Department of Industrial Relations has determined the general prevailing rate of wages in the locality for each craft or type of worker needed to execute the work. Said wage rates pursuant to Section 1773.2 of the Labor Code are on file with the Clerk to the Fresno County Board of Supervisors, and will be made available to any interested person on request. A copy of this wage scale may also be obtained at the following Web Site: *www.dir.ca.gov/dlsr.* 

- B. Pursuant to Section 1775 of the Labor Code of the State of California, nothing in this Article shall prevent the employment of properly registered apprentices upon public works. Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only at the work of the craft or trade to which he/she is registered.
- C. Only apprentices, as defined in Section 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4 (commencing at Section 3070), Division 3, of the Labor Code, are eligible to be employed on public works. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she is training.
- D. Fresno County is committed to increasing the availability of employment and training opportunities, with particular attention to the plight of those who are most economically disadvantaged. In an effort to advance that purpose, the County will require that the Contractor and each subcontractor employed on this Project shall use their best efforts to ensure that thirty-three percent (33%) of apprentice hours, as determined by California Labor Code Section 1777.5 for each contractor and subcontractor of any tier on this Project, are performed by qualified participants in state approved apprenticeship programs who also are current or former "Welfare-to-Work" participants in the CalWORKs program. Provided, that nothing contained in this Paragraph D shall be interpreted to relieve or in any way diminish the obligation of the Contractor and each subcontractor to comply fully with all applicable apprenticeship laws in accordance with the California Labor Code and the California Code of Regulations; and accordingly such requirements as are contractually imposed by this Paragraph D shall be in addition to such legally mandated requirements, and applicable only to the extent fully consistent therewith.

## Add between the 9th and 10th paragraphs of section 7-1.03:

If a height differential of more than 0.04 foot is created by construction activities at a joint transverse to the direction of traffic on the traveled way or a shoulder subject to public traffic, construct a temporary taper at the joint with a slope complying with the requirements shown in the following table:

| Height differential | Slope (horizontal:vertical)  |                                |
|---------------------|------------------------------|--------------------------------|
| (foot)              | Taper use of 14 days or less | Taper use of more than 14 days |
| Greater than 0.08   | 100:1 or flatter             | 200:1 or flatter               |
| 0.04–0.08           | 70:1 or flatter              | 70:1 or flatter                |

#### **Temporary Tapers**

For a taper on existing asphalt concrete or concrete pavement, construct the taper with minor HMA under section 39-2.07.

Grind existing surfaces to accommodate a minimum taper thickness of 0.10 foot under either of the following conditions:

- 1. HMA material such as rubberized HMA, polymer-modified bonded wearing course, or open-graded friction course is unsuitable for raking to a maximum 0.02 foot thickness at the edge
- 2. Taper will be in place for more than 14 days

For a taper on a bridge deck or approach slab, construct the taper with polyester concrete under section 60-3.04B.

The completed surface of the taper must be uniform and must not vary more than 0.02 foot from the lower edge of a 12-foot straightedge when placed on its surface parallel and perpendicular to traffic.

If authorized, you may use alternative materials or methods to construct the required taper.

#### Replace the headings and paragraphs of Section 7-1.04 with:

## 7-1.04 PUBLIC SAFETY

## 7-1.04A GENERAL

You are responsible to provide for public safety.

Do not construct a temporary facility that interferes with the safe passage of traffic.

Control dust resulting from the work, inside and outside the right-of-way.

Move workers, equipment, and materials without endangering traffic.

Whenever your activities create a condition hazardous to the public, furnish, erect and maintain those fences, temporary railing, barricades, lights, signs, and other devices and take any other necessary protective measures to prevent damage or injury to the public.

Any fences, temporary railing, barricades, lights, signs, or other devices furnished, erected and maintained by you are in addition to those for which payment is provided elsewhere in the specifications.

Provide flaggers whenever necessary to ensure that the public is given safe guidance through the work zone. At locations where traffic is being routed through construction under one-way controls, move your equipment in compliance with the one-way controls unless otherwise ordered.

Use of signs, lights, flags, or other protective devices must comply with the *California MUTCD* and any directions of the Engineer. Signs, lights, flags or other protective devices must not obscure the visibility of, nor conflict in intent, meaning, and function of either existing signs, lights and traffic control devices, or any construction area signs.

Keep existing traffic signals and highway lighting in operation. Other forces within the Department will perform routine maintenance of these facilities during the work.

Cover signs that direct traffic to a closed area.

Install temporary illumination in a manner which the illumination and the illumination equipment does not interfere with public safety. The installation of general roadway illumination does not relieve you from furnishing and maintaining any protective devices.

Equipment must enter and leave the highway via existing ramps and crossovers and must move in the direction of traffic. All movements of workmen and construction equipment on or across lanes open to traffic must be performed in a manner that do not endanger the public. Your vehicles or other mobile equipment leaving an open traffic lane to enter the construction area must slow down gradually in advance of the location of the turnoff to give the traffic following an opportunity to slow down. When leaving a work area and entering a roadway carrying traffic, your vehicles and equipment must yield to traffic.

Immediately remove hauling spillage from a roadway lane or shoulder open to traffic. When hauling on roadways, trim loads and remove material from shelf areas to minimize spillage.

Notify the Engineer not less than 5 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

Do not store vehicles, material, or equipment in a way that:

- 1. Creates a hazard to the public
- 2. Obstructs traffic control devices

Do not install or place temporary facilities used to perform the work which interfere with the free and safe passage of traffic.

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.

If you appear to be neglectful or negligent in furnishing warning devices and taking protective measures, the Engineer may direct your attention to the existence of a hazard. You must furnish and install the necessary warning devices. If the Engineer points out the inadequacy of warning devices and protective measures, that action on the part of the Engineer does not relieve you from your responsibility for public safety or abrogate your obligation to furnish and pay for these devices and measures.

Install Type K temporary railing or other authorized protective systems under any of the following conditions:

- 1. Excavations: Where the near edge of the excavation is within 15 feet from the edge of an open traffic lane
- 2. Temporarily unprotected permanent obstacles: When the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and you elect to install the obstacle before installing the protective system; or you, for your convenience and as authorized, remove a portion of an existing protective railing at an obstacle and do not replace such railing completely the same day
- 3. Storage areas: When material or equipment is stored within 15 feet of the edge of an open traffic lane and the storage is not otherwise prohibited by the Contract
- 4. Height differentials: When construction operations create a height differential greater than 0.15 feet within 15 feet of the edge of traffic lane

Installation of Type K temporary railing is not required if an excavation within 15 feet from the edge of an open traffic lane is protected by any of the following:

- 1. Steel plate or concrete covers of adequate thickness to prevent accidental entry by traffic or the public
- 2. Side slope where the downhill slope is 4:1 (horizontal: vertical) or less unless a naturally occurring condition
- 3. Barrier or railing

Offset the approach end of Type K temporary railing a minimum of 15 feet from the edge of an open traffic lane. Install the temporary railing on a skew toward the edge of the traffic lane of not more than 1 foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing must be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules must be installed at the approach end of the temporary railing.

Secure Type K temporary railing in place before starting work for which the temporary railing is required.

Where 2 or more lanes in the same direction are adjacent to the area where the work is being performed, including shoulders, the adjacent lane must be closed under any of the following conditions:

- 1. Work is off the traveled way but within 6 feet of the edge of the traveled way, and the approach speed is greater than 45 miles per hour
- 2. Work is off the traveled way but within 3 feet of the edge of the traveled way, and the approach speed is less than 45 miles per hour

Closure of the adjacent traffic lane is not required when performing any of the following:

- 1. Working behind a barrier
- 2. Paving, grinding, or grooving
- 3. Installing, maintaining, or removing traffic control devices except Type K temporary railing

Do not reduce an open traffic lane width to less than 10 feet. When traffic cones or delineators are used for temporary edge delineation, the side of the base of the cones or delineators nearest to traffic is considered the edge of the traveled way.

If a traffic lane is closed with channelizers for excavation work, move the devices to the adjacent edge of the traveled way when not excavating. Space the devices as specified for the lane closure.

Do not move or temporarily suspend anything over a traffic lane open to the public unless the public is protected.

### 7-1.04B WORK ZONE SAFETY AND MOBILITY

#### 7-1.04B(1) POLICY

In order to ensure safe and efficient flow of traffic through work zones, the County of Fresno, via its General Plan, Transportation and Circulation Element, Policy TRA-1, has adopted the use of AASHTO Standards as supplemented by Caltrans and County Department of Public Works and Planning Standards.

### 7-1.04B(2)TRAFFIC MANAGEMENT PLAN

Perform traffic management shall be in accordance with Section 12, "TEMPORARY TRAFFIC CONTROL," of these special provisions.

### 7-1.04B(3)TEMPORARY TRAFFIC CONTROL PLAN

Prepare traffic control plan(s) in accordance with Section 12, "TEMPORARY TRAFFIC CONTROL," of these special provisions.

### 7-1.04B(4)PUBLIC INFORMATION

Provide notice to notice to public agencies and others to the extent required, if any, elsewhere in these special provisions. The Engineer provides other noticing not identified to be performed by the Contractor.

#### Replace the headings and paragraphs of Section 7-1.06 with:

#### 7-1.06 INSURANCE

#### 7-1.06A General

Nothing in the Contract is intended to establish a standard of care owed to any member of the public or to extend to the public the status of a third-party beneficiary for any of these insurance specifications.

#### 7-1.06B Casualty Insurance

Obtain and maintain insurance on all of your operations with companies acceptable to the Department as follows:

- 1. Keep all insurance in full force and effect from the start of the work through Contract acceptance.
- 2. All insurance must be with an insurance company with a rating from A.M. Best Financial Strength Rating of A or better and a Financial Size Category of VIII or better.
- 3. Maintain completed operations coverage with a carrier acceptable to the State through the expiration of the patent deficiency in construction statute of repose set forth in Civ Pro Code § 337.1.

#### 7-1.06C Workers' Compensation and Employer's Liability Insurance

Under Labor Code § 1860, secure the payment of worker's compensation under Labor Code § 3700.

Submit to the Department the following certification before performing the work (Labor Code § 1861):

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with

the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

Contract signing constitutes certification submittal.

Provide Employer's Liability Insurance in amounts not less than:

- 1. \$1,000,000 for each accident for bodily injury by accident
- 2. \$1,000,000 policy limit for bodily injury by disease
- 3. \$1,000,000 for each employee for bodily injury by disease

If there is an exposure of injury to your employees under the U.S. Longshoremen's and Harbor Workers' Compensation Act, the Jones Act, or under laws, regulations, or statutes applicable to maritime employees, coverage must be included for such injuries or claims.

#### 7-1.06D Liability Insurance

#### 7-1.06D(1) General

Carry General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of you providing insurance for bodily injury liability and property damage liability for the following limits and including coverage for:

- 1. Premises, operations and mobile equipment
- 2. Products and completed operations
- 3. Broad form property damage (including completed operations)
- 4. Explosion, collapse, and underground hazards
- 5. Personal injury
- 6. Contractual liability

#### 7-1.06D(2) Liability Limits/Additional Insureds

Refer to the Agreement of these special provisions

Additional insured coverage must be provided by a policy provision or by an endorsement providing coverage at least as broad as *Additional Insured* (Form B) endorsement form CG 2010, as published by the Insurance Services Office (ISO), or other form designated by the Department.

#### 7-1.06D(3) Contractor's Insurance Policy is Primary

The policy must stipulate that the insurance afforded the additional insureds applies as primary insurance. Any other insurance or self-insurance maintained by the State is excess only and must not be called upon to contribute with this insurance.

#### 7-1.06E Automobile Liability Insurance

Comply with requirements in the Agreement of these special provisions

#### 7-1.06F Policy Forms, Endorsements, and Certificates

Provide your General Liability Insurance under Commercial General Liability policy form no. CG0001 as published by the Insurance Services Office (ISO) or under a policy form at least as broad as policy form no. CG0001.

#### 7-1.06G NOT USED

#### 7-1.06H Enforcement

The Department may assure your compliance with your insurance obligations. Ten days before an insurance policy lapses or is canceled during the Contract period you must submit to the Department evidence of renewal or replacement of the policy.

If you fail to maintain any required insurance coverage, the Department may maintain this coverage and withhold or charge the expense to you or terminate your control of the work.

You are not relieved of your duties and responsibilities to indemnify, defend, and hold harmless the State, its officers, agents, and employees by the Department's acceptance of insurance policies and certificates.

Minimum insurance coverage amounts do not relieve you for liability in excess of such coverage, nor do they preclude the State from taking other actions available to it, including the withholding of funds under this Contract.

## 7-1.06I Self-Insurance

Comply with the *Agreement* of these special provisions

### Replace the headings and paragraphs of Section 7-1.07 with:

## 7-1.07 LEGAL ACTIONS AGAINST THE DEPARTMENT

### 7-1.07A General

If legal action is brought against the Department over compliance with a State or federal law, rule, or regulation applicable to highway work, then:

- 1. If the Department in complying with a court order prohibits you from performing work, the resulting delay is a suspension related to your performance, unless the Department terminates the Contract.
- 2. If a court order other than an order to show cause or the final judgment in the action prohibits the Department from requiring you to perform work, the Department may delete the prohibited work or terminate the Contract.

### 7-1.07B Seal Coat Claims

This section applies to seal coat projects. Pay for claims for personal property damage caused by screening and bituminous binder. Seal coat claims are limited to:

- 1. 10 percent of the total bid
- 2. Damage occurring between the 1st day of screening spreading and 4 days after the last day of screening spreading for each seal coat location

Within 30 days of the last screening spreading, do the following:

- 1. Process and resolve all claims reported or submitted to you by the public as follows:
  - 1.1. Within 3 business days of receipt of a claim, submit to the Department a copy of the claim, a written analysis of the claim, and a statement indicating whether or not you will pay the claim. If you reject a claim, provide the reasons for rejection in writing.
  - 1.2. If the claimant becomes dissatisfied with your handling of the claim, immediately refer the claimant to the local district claims office for assistance in resolving the claim.
- 2. Submit to the Department evidence of your paid claims.

All claims presented to the Department, any district claims office, or the State Board of Control (Govt Code § 900 et seq.) are processed and resolved by the Department as follows:

- 1. The claims are processed as formal government claims subject to all laws and policies and are resolved as the Department determines including referring the claim to you for handling.
- 2. If the Department or the State Board of Control approves settlement of a claim or is ordered to pay pursuant to a court order, the claim is paid from funds withheld from you.
- 3. Within 3 business days of the Department's determination that you are responsible for resolving the claim, the Department sends a copy of the claim to you for resolution or notifies you of the Department's decision to resolve the claim.

The Department withholds an amount not to exceed 5 percent of the total bid to resolve all claims. The amount is held no longer than 60 days following the last spreading of screenings so that the Department has ample time to resolve any pending claims. After 60 days, any remaining amount withheld is returned to you.

If no withheld funds remain or have been returned, the Department may pay any claims and seek reimbursement from you through an offset or any other legal means. Any reimbursement or offset to be recovered from you, including all other paid claims, is limited to 10 percent of the total bid.

Section 7-1.07B does not limit your obligation to defend and indemnify the Department.

### 7-1.07C Claims

This section applies to non-seal coat projects which involve asphalt concrete paving. Pay for claims for personal property damage caused by your work. Claims are limited to:

1. 10 percent of the total bid

Within 30 days of the last working day placement of hot mix asphalt, do the following:

- 1. Process and resolve all claims reported or submitted to you by the public as follows:
  - 1.1. Within 3 business days of receipt of a claim, submit to the Department a copy of the claim, a written analysis of the claim, and a statement indicating whether or not you will pay the claim. If you reject a claim, provide the reasons for rejection in writing.
  - 1.2. If the claimant becomes dissatisfied with your handling of the claim, immediately refer the claimant to the local district claims office for assistance in resolving the claim.
- 2. Submit to the Department evidence of your paid claims.

All claims presented to the Department, (Govt Code § 900 et seq.) are processed and resolved by the Department as follows:

- 1. The claims are processed as formal government claims subject to all laws and policies and are resolved as the Department determines including referring the claim to you for handling.
- 2. If the Department approves settlement of a claim or is ordered to pay pursuant to a court order, the claim is paid from funds withheld from you.
- 3. Within 3 business days of the Department's determination that you are responsible for resolving the claim, the Department sends a copy of the claim to you for resolution or notifies you of the Department's decision to resolve the claim.

The Department withholds an amount not to exceed 5 percent of the total bid to resolve all claims. The amount is held no longer than 60 days following the last working day so that the Department has ample time to resolve any pending claims. After 60 days, any remaining amount withheld is returned to you.

If no withheld funds remain or have been returned, the Department may pay any claims and seek reimbursement from you through an offset or any other legal means. Any reimbursement or offset to be recovered from you, including all other paid claims, is limited to 10 percent of the total bid.

Section 7-1.07C does not limit your obligation to defend and indemnify the Department.

#### Add between the 1st and 2nd paragraphs of section 7-1.11A:

Comply with 46 CFR 381.7(a)-(b).

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## 8 PROSECUTION AND PROGRESS

#### Replace the headings and paragraphs in Section 8 with:

#### 8-1.01 GENERAL

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

#### 8-1.01A Work Hours

Perform all work on working days during daytime.

You may request approval to work on a holiday or on a non-working day. If, pursuant to such request, the Engineer authorizes you to work on a holiday or on a non-working day, you pay the actual cost incurred by the Department to perform all inspection, surveying, testing, and all other project-related work by the Department on such holiday or non-working day. Such payment will be deducted from monies due or which may become due to the Contractor.

Plan work so that all construction operations performed each day, including cleanup of the project site, establishment of appropriate traffic control and any other work necessary for the safety of the public shall be completed within the daytime hours.

Do not perform work during nighttime unless approved by the Engineer

Request approval to work during nighttime in writing and include the appropriate traffic control plan(s) and work plan(s) which clearly identify all provisions for illuminating all portions of the work site, including any flagging operations.

If you work fail to complete work during the daytime hours, the Engineer may stop all work upon the onset of nighttime and order you to perform any and all work the Engineer deems necessary to ensure the safety of the public during the nighttime hours.

You are not entitled to any additional compensation or extension of the contract time as a result of the Engineer stopping the work due to the onset of nighttime.

#### 8-1.02 SCHEDULE

#### Replace the headings and paragraphs of Section 8-1.02 with:

#### 8-1.02 SCHEDULE

When required by the special provisions, the Contractor shall submit to the Engineer a practicable progress schedule within 20 working days of approval of the contract, and within 10 working days of the Engineer's written request at any other time.

The schedule shall show the order in which the Contractor proposes to carry out the work, the dates on which the Contractor will start the several salient features of the work (including procurement of materials, plant, and equipment), and the contemplated dates for completing those salient features.

The progress schedules submitted shall be consistent in all respects with the time and order of work requirements of the contract.

Subsequent to the time that submittal of a progress schedule is required in accordance with these specifications, no progress payments will be made for any work until a satisfactory schedule has been submitted to the Engineer.

The Contractor shall notify the Engineer in writing at least two (2) working days prior to making any changes to the progress schedule. Changes in the progress schedule must be approved by the Engineer prior to being implemented by the Contractor.

The Contractor and all subcontractors shall deliver copies of his/her daily job logs to the Engineer on a weekly basis. At a minimum, the Contractor's and subcontractors' daily job logs shall include the Subcontractors working onsite, number of workers and their trade classification, description of work, visitors, temperature and weather conditions, accidents, delays, milestones and any other important information pertaining to the project that day.

#### 8-1.02B(3) Updated Schedule

Submit a monthly updated schedule that includes the status of work completed to date and the work yet to be performed as planned.

You may include changes to updated schedules that do not alter a critical path or extend the scheduled completion date compared to the current schedule. Changes may include:

- 1. Adding or deleting activities
- 2. Changing activity constraints
- 3. Changing durations
- 4. Changing logic

If any proposed change in planned work would alter the critical path or extend the scheduled completion date, submit a revised schedule within 15 days of the proposed change.

#### 8-1.02C-8-1.02F Reserved

#### 8-1.03 PRECONSTRUCTION CONFERENCE

Attend a preconstruction conference with key personnel, including your assigned representative, at a time and location determined by the Engineer. Submit documents as required before the preconstruction conference.

Be prepared to discuss the topics and documents shown in the following table:

| Торіс                                             | Document                                                    |  |
|---------------------------------------------------|-------------------------------------------------------------|--|
| Potential claim and dispute                       | Potential claim forms                                       |  |
| resolution                                        |                                                             |  |
| Contractor's representation                       | Assignment of Contractor's representative                   |  |
| DBE                                               | Final utilization reports                                   |  |
| Equipment                                         | Equipment list                                              |  |
| Labor compliance and equal employment opportunity | Job site posters and benefit and payroll reports            |  |
| Material inspection                               | Notice of Materials to be Used form                         |  |
| Materials on hand                                 | Request for Payment for Materials on Hand form              |  |
| Measurements                                      |                                                             |  |
| Partnering                                        |                                                             |  |
| Quality control                                   | QC plans                                                    |  |
| Safety                                            | Injury and Illness Prevention Program and job site posters  |  |
| Schedule                                          | Baseline schedule and Weekly Statement of Working Days form |  |
| Subcontracting                                    | Subcontracting Request form                                 |  |
| Surveying                                         | Survey Request form                                         |  |
| Traffic control                                   | Traffic contingency plan and traffic control plans          |  |
| Utility work                                      |                                                             |  |
| Weight limitations                                |                                                             |  |
| Water pollution control                           | SWPPP or WPCP                                               |  |
| Work restrictions                                 | PLACs                                                       |  |
| Action submittals                                 |                                                             |  |

#### 8-1.04 START OF JOB SITE ACTIVITIES

#### 8-1.04A General

Provide signed contracts, bonds, and evidence of insurance timely as required.

This section, 8-1.04, "Start of Job Activities," does not modify remedies available to the Department should you fail to provide signed contracts bonds and insurance timely.

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

You may start job site activities before receiving notice of Contract approval if you:

- 1. Deliver the signed Contract, bonds, and evidence of insurance to the Department
- 2. Submit 72-hour notice
- 3. Obtain an encroachment permit from the Department
- 4. Are authorized by the Department to start
- 5. Perform work at your own risk
- 6. Perform work under the Contract

If the Contract is approved, work already performed that complies with the Contract is authorized.

If the Contract is not approved, leave the job site in a neat condition. If a facility has been changed, restore it to its former condition or an equivalent condition. The Department does not pay for the restoration.

#### 8-1.04B Standard Start

Be prepared to begin work at the project site no later than the 20th business day after award of the Contract by the Department.

The Engineer may issue a notice to proceed as soon as the Contracts, including bonds and insurance certificates, have been approved.

Start work on the day shown in the notice to proceed, unless an early start has been approved.

The Engineer may issue a notice of commencement of contract time if you fail to provide Contracts, including bonds and insurance certificates or other required documents timely.

A notice of commencement of contract time does not authorize you to start work on the project site, but contract time begins to elapse on the date shown in the notice of commencement of contract time.

#### Complete work before the expiration of

#### Thirty (30) WORKING DAYS

from the date shown in said Notice to Proceed, or in the Notice of Commencement of Contract Time, whichever comes first.

Complete all work, including corrective work and punch list work, prior to the expiration of the allotted working days. Working days continue to accrue until corrective work and punch list work is completed and accepted.

In the event that additive bid(s) are awarded, additional working days will be granted in accordance with the following:

| Additive Bids Awarded      | Number of Additional Working Days |
|----------------------------|-----------------------------------|
| 1A – Auberry (Millerton to |                                   |
| Green Meadow)              | Two (2)                           |
|                            |                                   |
| 2A – Auberry (Green Meadow |                                   |
| to Quail Hollow)           | Three (3)                         |
|                            |                                   |

#### Pay to the County of Fresno the sum of

#### THREE THOUSAND FIVE HUNDRED DOLLARS (\$3,500.00)

per day for each and every calendar day's delay in finishing the work, including corrective work and punch list work, in excess of the total number of working days prescribed above.

#### 8-1.04C Long Lead Time Equipment Start

Reserved

#### 8-1.05 TIME

Contract time starts on the day specified in the notice to proceed or in the notice of commencement of contract time as described in section 8-1.04 or on the day you start job site activities, whichever occurs first.

Complete the work within the Contract time.

Meet each specified interim work completion date.

The Engineer issues a Weekly Statement of Working Days by the end of the following week.

The Weekly Statement of Working Days shows:

- 1. Working days and non-working days during the reporting week
- 2. Time adjustments
- 3. Work completion date computations, including working days remaining
- 4. Controlling activities

#### 8-1.06 SUSPENSIONS

The Engineer may suspend work wholly or in part due to conditions unsuitable for work progress. Provide for public safety and a smooth and unobstructed passageway through the work zone during the suspension as specified in sections 7-1.03 and 7-1.04. Providing the passageway is force account work. The Department makes a time adjustment for the suspension due to a critical delay.

The Engineer may suspend work wholly or in part due to your failure to (1) fulfill the Engineer's orders, (2) fulfill a Contract part, or (3) perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur. The Department may provide for a smooth and unobstructed passageway through the work during the suspension and deduct the cost from payments. The Department does not make a time adjustment for the suspension.

Upon the Engineer's order of suspension, suspend work immediately. Resume work when ordered.

#### 8-1.07 DELAYS

#### 8-1.07A General

To request a delay-related time or payment adjustment, submit an RFI.

#### 8-1.07B Time Adjustments

The Department may make a time adjustment for a critical delay. The Engineer uses information from the schedule to evaluate requests for time adjustments.

To request an adjustment, submit a revised schedule showing the delay's effect on the controlling activity. If the delay has:

- 1. Occurred, submit records of the dates and what work was performed during the delayed activity
- 2. Not occurred, submit the expected dates or duration of the delayed activity

Update the schedule to the last working day before the start of the delay if ordered.

#### 8-1.07C Payment Adjustments

The Department may make a payment adjustment for an excusable delay that affects your costs.

Only losses for idle equipment, idle workers, and moving or transporting equipment are eligible for delayrelated payment adjustments. The Engineer determines payment for idle time of equipment in the same manner as determinations are made for equipment used in the performance of force account work under section 9-1.04 with the following exceptions:

- 1. Delay factor in the *Labor Surcharge and Equipment Rental Rates* applies to each equipment rental rate.
- 2. Daily number of payable hours equals the normal working hours during the delay, not to exceed 8 hours per day.
- 3. Delay days exclude non-working days.
- 4. Markups are not added.

The Engineer determines payment adjustment for the idle workers under section 9-1.04B, but does not add markups.

The Engineer includes costs due to necessary extra moving or transporting of equipment.

The Department does not make a payment adjustment for overhead incurred during non–working days of additional construction seasons experienced because of delay.

### 8-1.08-8-1.09 RESERVED

### 8-1.10 LIQUIDATED DAMAGES

#### 8-1.10A General

The Department specifies liquidated damages (Pub Cont Code § 10226). Liquidated damages, if any, accrue starting on the 1st day after the expiration of the working days through the day of Contract acceptance except as specified in sections 8-1.10B and 8-1.10C.

The Department withholds liquidated damages before the accrual date if the anticipated liquidated damages may exceed the value of the remaining work.

Liquidated damages are specified in section 8-1.04.

#### 8-1.10B Failure to Complete Work Parts within Specified Times

The Department may deduct specified damages from payments for each day needed to complete a work part in excess of the time specified for completing the work part.

Damages for untimely completion of work parts may not be equal to the daily amount specified as liquidated damages for the project as a whole, but the Department does not simultaneously assess damages for untimely completion of work parts and for the whole work.

Damages accrue starting the 1st day after a work part exceeds the specified time through the day the specified work part is complete.

#### 8-1.10C Failure to Complete Work Parts by Specified Dates

The Department may deduct specified damages from payments for each day needed to complete a work part in excess of the specified completion date for the work part.

Damages for untimely completion of a work part may not be equal to the daily amount specified as liquidated damages for the project as a whole, but the Department does not simultaneously assess damages for untimely completion of a work part and the whole work.

Damages accrue starting the 1st day after an unmet completion date through the day the work part is complete.

#### 8-1.10D RESERVED

#### 8-1.11-8-1.12 RESERVED

#### 8-1.13 CONTRACTOR'S CONTROL TERMINATION

The Department may terminate your control of the work for failure to do any of the following (Pub Cont Code § 10253):

- 1. Supply an adequate workforce
- 2. Supply material as described
- 3. Pay subcontractors (Pub Cont Code §10262)
- 4. Prosecute the work as described in the Contract

The Department may also terminate your control for failure to maintain insurance coverage.

For a federal-aid project, the Department may terminate your control of the work for failure to include "Required Contract Provisions, Federal-Aid Construction Contracts" in subcontracts.

The Department gives notice to you and your surety at least 5 business days before terminating control. The notice describes the failures and the time allowed to remedy the failures. If failures are not remedied within the time provided, the Department takes control of the work.

The Department may complete the work if the Department terminates the Contractor's control or you abandon the project (Pub Cont Code § 10255). The Department determines the unpaid balance under Pub Cont Code § 10258 and the Contract.

At any time before final payment of all claims, the Department may convert a Contractor's control termination to a Contract termination.

### 8-1.14 CONTRACT TERMINATION

#### 8-1.14A General

The Director may terminate the Contract if it serves the State's best interest. The Department issues you a written notice, implements the termination, and pays you.

#### 8-1.14B Relief from Responsibility for Work

Upon receiving a termination notice:

- 1. Stop work
- 2. Notify subcontractors and suppliers of the Contract termination and stop Contract-related work
- 3. Perform the Engineer-ordered work to secure the job site for termination
- 4. Remove equipment
- 5. Subject to the Engineer's authorization, settle termination-related claims and liabilities involving subcontractors and suppliers; assign to the Department the rights, titles, or interests held by you with respect to these parties

## 8-1.14C Responsibility for Materials

Upon receiving a termination notice, protect unused material until:

- 1. You submit an inventory of materials already produced, purchased, or ordered but not yet used; include the location of the material.
- 2. The Engineer identifies materials that will be retained by the Department. Submit bills of sales or other records of material title.
- 3. The Engineer confirms that unused materials paid by progress payment and materials furnished by the State have been delivered and stored as ordered.
- 4. The titles are transferred for materials purchased by the Department.

Dispose of materials that will not be retained by the Department.

#### 8-1.14D Contract Acceptance after Termination

The Engineer recommends Contract acceptance after determining the completion of:

- 1. Work ordered to be completed before termination
- 2. Other work ordered to secure the project before termination
- 3. Material delivery and title transfer

The Department pays you under section 9-1.17.

### 8-1.14E Payment Adjustment for Termination

If the Department issues a termination notice, the Engineer determines the payment for termination based on the following:

- 1. Direct cost for the work:
  - 1.1. Including:
    - 1.1.1. Mobilization.
    - 1.1.2. Demobilization.
    - 1.1.3. Securing the job site for termination.
    - 1.1.4. Losses from the sale of materials.
  - 1.2. Not including:
    - 1.2.1. Cost of materials you keep.
    - 1.2.2. Profit realized from the sale of materials.
    - 1.2.3. Cost of material damaged by:
      - 1.2.3.1. Act of God.
      - 1.2.3.2. Act of a public enemy.
      - 1.2.3.3. Fire.
      - 1.2.3.4. Flood.
      - 1.2.3.5. Governor-declared state of emergency.
      - 1.2.3.6. Landslide.
      - 1.2.3.7. Tsunami.
    - 1.2.4. Other credits.
- 2. Cost of remedial work, as estimated by the Engineer, is not reimbursed.
- 3. Allowance for profit not to exceed 4 percent of the cost of the work. Prove a likelihood of having made a profit had the Contract not been terminated.
- 4. Material handling costs for material returned to the vendor or disposed of as ordered.
- 5. Costs in determining the payment adjustment due to the termination, excluding attorney fees and litigation costs.

Termination of the Contract does not relieve the surety of its obligation for any just claims arising out of the work performed.

#### 8-1.15-8-1.16 RESERVED

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## **9 PAYMENT**

Add the following Section 9-1.01A

## 9-1.01A COMPENSATION

The bid items shown in the bid proposal sheet represent full compensation for performing all work. Full compensation for any work for which there is no bid item shall be considered to be included in the various items of work.

#### Replace the headings and paragraphs of Section 9-1.03 with:

#### 9-1.03 PAYMENT SCOPE

The Department pays you for furnishing the resources and activities required to complete the work. The Department's payment is full compensation for furnishing the resources and activities, including:

- 1. Risk, loss, damage repair, or cost of whatever character arising from or relating to the work and performance of the work
- 2. PLACs and taxes
- 3. Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

The Department does not pay for your loss, damage, repair, or extra costs of whatever character arising from or relating to the work that is a direct or indirect result of your choice of construction methods, materials, equipment, or manpower, unless specifically mandated by the Contract.

Payment is:

- 1. Full compensation for all work involved in each bid item shown on the Bid Item List by the unit of measure shown for that bid item
- 2. For the price bid for each bid item shown on the Bid Item List or as changed by change order with a specified price adjustment

Full compensation for work specified in divisions I, II, and X is included in the payment for the bid items unless:

- 1. Bid item for the work is shown on the Bid Item List
- 2. Work is specified as change order work

Work paid for under one bid item is not paid for under any other bid item.

Payment for a bid item includes payment for work in sections referenced by the section set forth by that bid item.

Notwithstanding anything to the contrary in these special provisions, full compensation for performing all work as shown, as specified, and as directed by the Engineer is considered to be included in the various bid items, and no additional payment will be made, except pursuant to a contract change order to perform work not shown and/or specified.

# If one or more bid item(s) is/are not included, perform the work as shown and as specified and payment therefor is considered to be included in the various items of work.

If an alternative is described in the Contract, the Department pays based on the bid items for the details and specifications not described as an alternative unless the bid item is described as an alternative, in which case, the Department pays based on the details and specifications for that alternative.

The Department pays for change order work based on one or a combination of the following:

- 1. Bid item prices
- 2. Force account
- 3. Agreed price
- 4. Specialist billing

If the Engineer chooses to pay for change order work based on an agreed price, but you and the Engineer cannot agree on the price, the Department pays by force account.

If a portion of extra work is covered by bid items, the Department pays for this work as changed quantities in those items. The Department pays for the remaining portion of the extra work by force account or agreed price.

If the amount of a deduction or withhold exceeds final payment, the Department invoices you for the difference, to be paid upon receipt.

Pay your subcontractors within 10 days of receipt of each progress payment under Pub Cont Code §§ 10262 and 10262.5.

## 9-1.07 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

Replace Section 9-1.07A with:

## 9-1.07A General

Section 9-1.07 applies to asphalt contained in materials for pavement structures and pavement surface treatments such as HMA, tack coat, asphaltic emulsions, bituminous seals, asphalt binders, and modified

asphalt binders placed in the work. Section 9-1.07 does not apply if you opted out of payment adjustments for price index fluctuations at the time of bid.

The Engineer adjusts payment whenever the California statewide crude oil price index for the month the material is placed is more than 5 percent higher or lower than the price index at the time of bid.

The California Department of Transportation determines the California statewide crude oil price index each month on or about the 1st business day of the month using the average of the posted prices in effect for the previous month as posted by Chevron, ExxonMobil, and ConocoPhillips for the Buena Vista and Midway Sunset fields.

If a company discontinues posting its prices for a field, the Department determines the index from the remaining posted prices. The Department may include additional fields to determine the index.

For the California statewide crude oil price index, go to the California Department of Transportation Division of Construction Web site.

If the adjustment is a decrease in payment, the Department deducts the amount from the monthly progress payment.

The Department makes payment adjustments due to price index fluctuations for changed quantities under section 9-1.06.

If you do not complete the work within the Contract time, payment adjustments during the overrun period are determined using the California statewide crude oil price index in effect for the month in which the overrun period began.

If the price index at the time of placement increases:

- 1. 50 percent or more over the price index at bid opening, notify the Engineer.
- 2. 100 percent or more over the price index at bid opening, do not furnish material containing asphalt until the Engineer authorizes you to proceed with that work. The Department may decrease bid item quantities, eliminate bid items, or terminate the Contract.

Before placing material containing asphalt, submit the current sales and use tax rate in effect in the tax jurisdiction where the material is to be placed.

Submit a public weighmaster's certificate for HMA, tack coat, asphaltic emulsions, and modified asphalt binders, including those materials not paid for by weight. For slurry seals, submit a separate public weighmaster's certificate for the asphaltic emulsion.

#### **Replace Section 9-1.16F with:**

#### 9-1.16F Retentions

The Department, once in each month, shall cause an estimate in writing to be made by the Engineer. The estimate shall include the total amount of work done and acceptable materials furnished, provided the acceptable materials are listed as eligible for partial payment as materials in the special provisions and are furnished and delivered by the Contractor on the ground and not used or are furnished and stored for use on the contract, if the storage is within the State of California and the Contractor furnishes evidence satisfactory to the Engineer that the materials are stored subject to or under the control of the Department, to the time of the estimate, and the value thereof. The estimate shall also include any amounts payable for mobilization. Daily extra work reports furnished by the Contractor less than 5 calendar days, not including Saturdays, Sundays and legal holidays, before the preparation of the monthly progress estimate shall not be eligible for payment until the following month's estimate.

The amount of any material to be considered in making an estimate will in no case exceed the amount thereof which has been reported by the Contractor to the Engineer on State-furnished forms properly filled out and executed, including accompanying documentation as therein required, less the amount of the material incorporated in the work to the time of the estimate. Only materials to be incorporated in the

work will be considered. The estimated value of the material established by the Engineer will in no case exceed the contract price for the item of work for which the material is furnished.

The Department shall retain 5 percent of the estimated value of the work done and 5 percent of the value of materials so estimated to have been furnished and delivered and unused or furnished and stored as aforesaid as part security for the fulfillment of the contract by the Contractor.

The Department shall pay monthly to the Contractor, while carrying on the work, the balance not retained, as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of the contract. No monthly estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract.

No monthly estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

No partial payment will be made for any materials on hand which are furnished but not incorporated in the work.

#### Add the following Section 9-1.23:

#### 9-1.23 RESOLUTION OF CONTRACT CLAIMS

Public works contract claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a Contractor and a local public agency shall be resolved in accordance with the provisions of California Public Contract Code Sections 20104-20104.6, inclusive. In addition, California Public Contract Code Section 9204 requires that the procedure established therein shall apply to all claims (as therein defined) filed by a contractor in connection with a public works project. Accordingly, this contract expressly incorporates all of the terms and conditions of those statutory provisions, which are as follows:

#### California Public Contract Code Section 9204

(a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:

(1) "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.
(C) Payment of an amount that is disputed by the public entity.

(2) "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

(3)(A) "Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

(B) "Public entity" shall not include the following:

(i) The Department of Water Resources as to any project under the jurisdiction of that department.

(ii) The Department of Transportation as to any project under the jurisdiction of that department.

(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.

(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.

(v) The Military Department as to any project under the jurisdiction of that department.

(vi) The Department of General Services as to all other projects.

(vii) The High-Speed Rail Authority.

(4) "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

(5) "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

(d) (1) (A) Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.

(B) The claimant shall furnish reasonable documentation to support the claim.

(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

(D) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

(2) (A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties

cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.

(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2020, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2020, deletes or extends that date.

## California Public Contract Code Sections 20104 - 20104.6

#### Section 20104

(a)(1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and a local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.

(b)(1) "Public work" means "public works contract" as defined in Section 1101 but does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

#### Section 20104.2

For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b) (1) For claims of less than fifty thousand dollars (\$50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c) (1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventyfive thousand dollars (\$375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant. (2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

## Section 20104.4

The following procedures are established for all civil actions filed to resolve claims subject to this article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

**(b)** (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act (Title 4 (commencing with Section 2016.010) of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

### Section 20104.6

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

### Add the following Section 9-1.24:

## 9-1.24 SUPPLEMENTAL WORK (PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS)

This item is provided solely to provide funds necessary for adjustments to the prices of those oilcontaining materials expressly specified as eligible for such adjustments in "Payment Adjustments for Price Index Fluctuations," elsewhere in these special provisions.

The amount included for this item is an estimate only, and is a predetermined amount included in the bid proposal sheet(s) for the project.

This item, "Supplemental Work (Payment Adjustments for Price Index Fluctuations" is purely administrative in nature, is not intended to limit such payment adjustments to the number provided in the bid proposal sheet(s), nor is it intended to modify or supplement the provisions in "Payment Adjustments for Price Index Fluctuations," in any manner whatsoever. Any and all such adjustments shall be made in strict conformance with the requirements in said section.

The provisions in Section 9-1.06, "Changed Quantity Pay Adjustments" of the Standard Specifications shall not apply to the item "Supplemental Work (Payment Adjustments for Price Index Fluctuations)."

#### Add the following Section 9-1.25:

#### 9-1.25 SUPPLEMENTAL WORK

The Supplemental Work bid item is provided to compensate the Contractor for new and unforeseen work necessary to construct the project as designed and intended. Supplemental Work is not for design changes. Supplemental Work will be classed as extra work in accordance with the provisions of Section 4-1.05, "Changes and Extra Work," of the Standard Specifications. The dollar amount for supplemental work shown in the Proposal is an estimate only, and shall be included in each bidder's proposal.

Supplemental Work shall be performed only upon direct written authorization from the Engineer and daily extra work reports shall be submitted to and approved by the Engineer. The contractor shall maintain

separate records for extra work performed in accordance with the provisions of Section 5-1.27, "Records," of the Standard Specifications and these special provisions.

Payment will be based on the total amount of authorized Supplemental Work actually performed. The provisions in Section 9-1.06, "Changed Quantity Pay Adjustments" of the Standard Specifications shall not apply to the item "Supplemental Work."

## Add to section 10-1.02

The Contractor shall complete all Bituminous Seal Coat work on the west side of State Highway 99 prior to beginning work on the east side of State Highway 99

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## **DIVISION II GENERAL CONSTRUCTION**

## **12 TEMPORARY TRAFFIC CONTROL**

### Replace section 12-1.04 with:

### 12-1.04 FLAGGING COSTS

You pay the cost of furnishing all flaggers, including transporting flaggers and furnishing stands and towers for flaggers to provide for the passage of traffic through the work as specified in sections 7-1.03 and 7-1.04.

#### Replace Section 12-3.01C With:

## 12-3.01C Construction

If channelizing devices are used on the project, perform all layout work necessary to place channelizing devices:

- 1. On the proper alignment
- 2. Uniformly at the location and spacing described
- 3. Straight on a tangent alignment
- 4. On a true arc in a curved alignment

If temporary traffic control devices are damaged, displaced, or stop operating or functioning as described from any cause during the progress of the work, immediately repair, repaint, or replace the components and restore them to their original locations and positions.

If ordered, furnish and place additional temporary traffic control devices. This work is not change order work if:

- 1. Required to conform with your traffic control plan
- 2. Required to conform with the MUTCD
- 3. Necessary for public safety or convenience as determined by the Engineer
- 4. Required to perform staged construction shown on the plans

## Replace Section 12-3.03C With:

## 12-3.03C Construction

If plastic traffic drums are used on project, use 1 type of plastic traffic drum on the project.

Use the same type and brand of retroreflective sheeting for all plastic traffic drums used on the project.

Do not use sandbags or comparable ballast.

Moving plastic traffic drums from location to location if ordered after initial placement is not change order work if:

- 1. Required to conform with your traffic control plan
- 2. Required to conform with the MUTCD
- 3. Necessary for public safety or convenience as determined by the Engineer
- 4. Required to perform staged construction shown on the plans

### 12-3.10C Construction

#### Replace Section 12-3.10C With:

If barricades are used on the project, place each barricade such that the stripes slope downward in the direction road users are to pass.

Place each sand-filled bag near the ground level on the lower parts of the frame or stays to serve as ballast for the barricades. Do not place ballast on top of barricades or over any retroreflective barricade rail face that is facing traffic.

Do not remove barricades that are shown to be left in place at the time of work completion.

Moving a barricade from location to location is change order work if ordered after initial placement of the barricade unless.

- 1. Required to conform with your traffic control plan
- 2. Required to conform with the MUTCD
- 3. Necessary for public safety or convenience as determined by the Engineer
- 4. Required to perform staged construction shown on the plans

#### Replace Section 12-3.20C(1) With:

#### 12-3.20C1 General

If type K temporary rail is used on the project, before placing Type K temporary railing on the job site, paint the exposed surfaces of the railing with white paint complying with the specifications for acrylic emulsion paint for exterior masonry.

Place Type K temporary railing on a firm, stable foundation. Grade the foundation to provide a uniform bearing surface throughout the entire length of the railing.

Structure excavation and backfill must comply with section 19-3 except compaction of earth fill placed behind Type K temporary railing in a curved layout is not required.

Place and maintain the abutting ends of PC concrete units in alignment without substantial offset from each other.

The drilling of holes and bonding of threaded rods or dowels must comply with the specifications for drilling and bonding dowels in section 51-1.

Install a reflector on the top or face of the rail of each rail unit placed within 10 feet of a traffic lane. Apply adhesive for mounting the reflector under the reflector manufacturer's instructions.

Install a Type P marker panel at each end of railing placed adjacent to a 2-lane, two-way highway and at the end facing traffic for railing installed adjacent to a one-way roadbed. If the railing is placed on a skew, install the marker at the end of the skew nearest the traveled way. Type P marker panels must comply with section 82 except you must furnish the marker panels.

After removing Type K temporary railing:

- 1. Restore the area to its previous condition or construct it to its planned condition if temporary excavation or embankment was used to accommodate the railing.
- Remove all threaded rods or dowels to a depth of at least 1 inch below the surface of the concrete. Fill the resulting holes with mortar under section 51-1 except cure the mortar by the water method or by the curing compound method using curing compound no. 6.

If the Engineer orders a lateral move of Type K temporary railing and repositioning is not shown, the lateral move is change order work unless:

- 1. Required to conform with your traffic control plan
- 2. Required to conform with the MUTCD
- 3. Necessary for public safety or convenience as determined by the Engineer
- 4. Required to perform staged construction shown on the plans

### Replace Section 12-3.22C With:

### 12-3.22C Construction

If crash cushion modules are used on the project, use the same type of crash cushion module for a single grouping or array.

Temporary crash cushion arrays must not encroach on the traveled way.

Secure the sand-filled modules in place before starting an activity requiring a temporary crash cushion.

Maintain sand-filled temporary crash cushions in place at each location, including times when work is not actively in progress. You may remove the crash cushions during the work shift for access to the work if the exposed fixed obstacle is 15 feet or more from the nearest lane carrying traffic. Reset the crash cushion before the end of the work shift.

Immediately repair sand-filled temporary crash cushion modules damaged due to your activities. Remove and replace any module damaged beyond repair. Repair and replacement of temporary crash cushion modules damaged by traffic are change order work.

You may place sand-filled temporary crash cushion modules on movable pallets or frames complying with the dimensions shown. The pallets or frames must provide a full-bearing base beneath the modules. Do not move the modules and supporting pallets or frames by sliding or skidding along the pavement or bridge deck.

Attach a Type R or Type P marker panel to the front of the temporary crash cushion if the closest point of the crash cushion array is within 12 feet of the traveled way. Firmly fasten the marker panel to the crash cushion with commercial quality hardware or by other authorized methods. Attach the Type R marker panel such that the top of the panel is 1 inch below the module lid. Attach the Type P marker panel such that the bottom of the panel rests upon the pallet or roadway surface if pallets are not used.

A lateral move of a temporary crash cushion module is change order work if ordered and the repositioning is not shown, unless required for staged construction.

Remove sand-filled temporary crash cushion modules, including sand, pallets or frames, and marker panels, at Contract acceptance. Do not install sand-filled temporary crash cushion modules in the permanent work.

#### Replace section 12-3.31C with:

## 12-3.31C Construction

If portable flashing beacons are used on the project, remove portable flashing beacons from the traveled way at the end of each night's work. You may store the flashing beacon at selected central locations within the highway where designated by the Engineer.

Moving portable flashing beacons from location to location if ordered after initial placement is change order work unless:

- 1. Required to conform with your traffic control plan
- 2. Required to conform with the MUTCD
- 3. Necessary for public safety or convenience as determined by the Engineer
- 4. Required to perform staged construction shown on the plans

#### Replace Section 12-3.35B(6) with:

#### 12-3.35B(6) User Interface

If the project includes an AWIS, the system must have a user interface to control the AWIS PCMS communications. The interface must be (1) software compatible with a Windows environment or (2) a web service accessed by a web browser.

Provide any software on a CD or other Engineer-authorized data-storage device.

The user interface must, at a minimum, provide the user with a list of AWIS PCMSs in the field, location information for each AWIS PCMS, and a real-time on-board display of the message in the field. Control options must, at a minimum, provide the user the ability to change the on-board messages and flash rate.

## Replace the headings and paragraphs of Section 12-4 with: 12-4 MAINTAINING TRAFFIC

### 12-4.01 GENERAL

#### 12-4.01A General

Section 12-4.01 includes general specifications for maintaining traffic through construction work zones.

If local authorities regulate traffic, notify them at least 5 business days before the start of job site activities. Cooperate with the local authorities to handle traffic through the work zone and to make arrangements to keep the work zone clear of parked vehicles.

#### 12-4.01B Materials

Not Used

### 12-4.01C CONSTRUCTION

Furnishing and operating pilot cars is not change order work.

#### 12-4.01D Payment

Not Used

#### 12-4.02 TRAFFIC CONTROL SYSTEMS

#### 12-4.02A General

#### 12-4.02A(1) Summary

Section 12-4.02 includes specifications for providing a traffic control system to close traffic lanes, shoulders, and roadways.

A traffic control system for a closure includes the temporary traffic control devices described as part of the traffic control system. Temporary traffic control devices must comply with section 12-3.

#### 12-4.02A(2) Definitions

designated holidays: Designated holidays are shown as "holidays" in Section 1-1.07B.

## 12-4.02A(3) Submittals

## 12-4.02A(3)(a) General

The Contractor shall prepare and submit to the County Construction Engineer for approval, a traffic control system plan indicating the means and methods he will employ to institute and maintain traffic control for all phases of the work within the project. The traffic control system plan shall be submitted to the County Construction Engineer as early as possible, preferably **five (5) working days** prior to pre-construction meeting. The Engineer will require five (5) working days to review the initial submittal of the traffic control system plan and an additional five (5) working days for each successive review.

No work at the project site whatsoever, including preparatory work such as the installation of construction project funding signs, shall commence until the traffic control system plan has been approved in writing by the Engineer. In the event that the traffic control system plan is not submitted timely, the Engineer may issue a notice of commencement of contract time prior to approval of the traffic control system plan, and working days will begin to accrue against the allotted contract time.

Late submittal of the traffic control plan or revisions thereafter required, due to the inadequacy of the plan, shall not be accepted as justification for the delay in the start of the working days for the project.

It shall be the Contractor's responsibility to provide, install, maintain, and remove any and all detour signage and traffic control devices and to obtain all permits, including permits from Caltrans, as may be necessary to establish detours as part of the contractor's traffic control plan.

Traffic will not be allowed to be limited to one direction when construction activities are not actively in progress. Providing, installing, maintaining, and removing all traffic control, including portable changeable message signs if required, obtaining and complying with all permits, and providing all traffic control operations shall be the responsibility of the contractor, and no additional compensation will be allowed therefor.

## 12-4.02A(3)(b) Closure Schedules

One-way traffic shall be controlled through the project in accordance with the California Manual MUTCD and Caltrans Standard Plans T-11 and T-13 entitled "Traffic Control System for Lane Closure on Multilane Conventional Highways" and "Traffic Control System for Lane Closure on Two Lane Conventional Highways," and these special provisions. Night closure will not be permitted.

When traffic is under one way control on unpaved areas, the cones shown along the centerline on the plan need not be placed.

Every Monday by noon, submit a closure schedule request for planned closures for the next week.

The next week is defined as Sunday at noon through the following Sunday at noon.

Submit a closure schedule request 5 days before the anticipated start of any job site activity that reduces:

- 1. Horizontal clearances of traveled ways, including shoulders, to 2 lanes or fewer due to activities such as temporary barrier placement and paving
- 2. Vertical clearances of traveled ways, including shoulders, due to activities such as pavement overlays, overhead sign installation, or falsework girder erection

Submit closure schedule changes, including additional closures, by noon at least 3 business days before a planned closure.

Cancel closure requests at least 48 hours before the start time of the closure.

The Department notifies you of unauthorized closures or closures that require coordination with other parties as a condition for authorization.

## 12-4.02A(3)(c) Contingency Plans for Closures

Submit a contingency plan for an activity that could affect a closure if a contingency plan is specified in the special provisions or if a contingency plan is requested.

If a contingency plan is requested, submit the contingency plan within 1 business day of the request.

The contingency plan must identify the activities, equipment, processes, and materials that may cause a delay in the opening of a closure to traffic. The plan must include:

- 1. List of additional or alternate equipment, materials, or workers necessary to ensure continuing activities and on-time opening of closures if a problem occurs. If the additional or alternate equipment, materials, or workers are not on the job site, specify their location, the method for mobilizing these items, and the required time to complete mobilization.
- 2. General time-scaled logic diagram displaying the major activities and sequence of the planned activities. For each activity, identify the critical event that will activate the contingency plan.

Submit revisions to a contingency plan at least 3 business days before starting the activity requiring the contingency plan. Allow 2 business days for review.

#### 12-4.02A(4) Quality Assurance

Reserved

#### 12-4.02B Materials

Not Used

## 12-4.02C Construction

#### 12-4.02C(1) General

Traffic will be controlled by flagmen by eyesight, radio (walkie talkie) or baton. In the event these methods do not work satisfactorily, as determined by the Engineer, a pilot car will be required.

The Engineer may require a pilot car to be used during earthwork operations in preparation of the grading plane or other operations when the Contractor's operations cover an area beyond the line of sight, or beyond the range of radios or when the baton method does not function satisfactorily.

Full compensation for furnishing and operating the pilot car, (including driver, radios, and any other equipment and labor required) shall be considered as included in the contract lump sum price paid for traffic control system and no further payment will be made therefor.

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

Additional advance flaggers are required.

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

#### 12-4.02C(3) Closure Requirements and Charts

#### 12-4.02C(3)(a) General

Where 2 or more lanes in the same direction, including the shoulders, are adjacent to the area where the work is being performed, close the adjacent lane under any of the following conditions:

- 1. Work is off the traveled way but within 6 feet of the edge of the traveled way, and the approach speed is greater than 45 mph
- 2. Work is off the traveled way but within 3 feet of the edge of the traveled way, and the approach speed is less than 45 mph

Closure of the adjacent traffic lane is not required during any of the following activities:

- 1. Work behind a barrier
- 2. Paving, grinding, or grooving
- 3. Installation, maintenance, or removal of traffic control devices except for temporary railing

## 12-4.02C(3)(b) - 12-4.02C(3)(n)

#### Reserved

### 12-4.02C(3)(o) Closure of Conventional County Roads

The type and location of signs, lights, flags, flagmen, and other traffic control and safety devices shall be in accordance with the current edition of the California Manual on Uniform Traffic Control Devices (MUTCD) issued by the State of California, Department of Transportation (Caltrans).

Public traffic shall be permitted to pass through construction at all times unless otherwise specified herein.

Provide access to properties abutting the project site at all times.

When directed by the Engineer, traffic shall be routed through the work under one-way control.

Under one-way reversing traffic control operations, public traffic may be stopped in one direction for periods not to exceed 10 minutes.

Lane closure is defined as the closure of a traffic lane or lanes within a single traffic control system.

A minimum of one paved traffic lane, not less than 11 feet wide, shall be open for use by public traffic at all times.

The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

The Contractor's attention is directed to private driveways and access roads. The driveways and access roads shall remain accessible at all times.

The Contractor's attention is directed to the access roads adjacent to the project site. Vehicular access to the channel bank access roads shall be maintained at all times.

The seal coats shall not be applied to more than one-half of the width to be sealed at time, and the remaining half width to be kept free of obstructions and open for use by public traffic until the seal coat first applied is finished as per Section 37.2.0 (c) (4) (d) ready for use by traffic.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including sections closed to public traffic.

When work vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed as shown on standard plan T-10.

The Contractor's equipment and materials shall not remain in a lane except when such lane is closed to traffic and the lane is being used for contract operations.

## 12-4.02C(3)(o)-12-4.02C(3)(s) Reserved

12-4.02C(4)-12.4.02C(6) Reserved

#### 12-4.02C(7) Traffic Control System Requirements

#### 12-4.02C(7)(a) General

Control traffic using stationary closures.

If components of the traffic control system are displaced or cease to operate or function as specified, immediately repair them to their original condition or replace them and place them back in their original locations.

Vehicles equipped with attenuators must comply with section 12-3.23.

Each vehicle used to place, maintain, and remove components of a traffic control system on a multilane highway must have a Type II flashing arrow sign that must operate whenever the vehicle is used for

placing, maintaining, or removing thed components. For a stationary closure, vehicles with a Type II flashing arrow sign not involved in placing, maintaining, or removing the components must display only the caution display mode. If a flashing arrow sign is required for a closure, activate the sign before the closure is in place.

## 12-4.02C(7)(b) Stationary Closures

Except for channelizing devices placed along open trenches or excavations adjacent to the traveled way, remove the components of the traffic control system for a stationary closure from the traveled way and shoulders at the end of each work period. You may store the components at authorized locations within the limits of the highway.

If a traffic lane is closed with channelizing devices for excavation work, move the devices to the adjacent edge of the traveled way when not excavating. Space the devices as shown for the lane closure.

### 12-4.02C(7)(c) Moving Closures

For a moving closure, use a PCMS that complies with section 12-3.32 except the sign must be truck mounted. The full operational height to the bottom of the sign may be less than 7 feet above the ground but must be as high as practicable.

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

## 12-4.02C(8) Traffic Control System Signs

### 12-4.02C(8)(a) General

Traffic control system signs must comply with section 12-3.11.

### 12-4.02C(8)(b) Connector and Ramp Closure Signs

Inform motorists of a temporary closing of a (1) connector or a (2) freeway or expressway entrance or exit ramp using:

- 1. SC6-3(CA) (Ramp Closed) sign for closures of 1 day or less
- 2. SC6-4(CA) (Ramp Closed) sign for closures of more than 1 day

SC6-3(CA) and SC6-4(CA) signs must be stationary mounted at the locations shown and must remain in place and visible to motorists during the connector or ramp closure.

Notify the Engineer at least 2 business days before installing the sign and install the sign from 7 to 15 days before the closure.

## 12-4.02C(10)-12-4.02C(11) Reserved

#### 12-4.02C(12) Failure to Provide Traffic Control.

If the Contractor does not provide the traffic control and it becomes necessary for the Engineer to notify the Contractor of his duties according to the Standard Specifications and these special provisions, the Contractor shall pay \$200 per 15-minute period or portion thereof to the County for all the time required to acquire the traffic control, including pilot car.

Such payment shall commence at the time notice of the improper traffic control condition is given to the Contractor or his authorized representative by the Engineer and shall terminate when the condition is corrected. Such payment will be deducted from the Contractor's payment.

In addition thereto, when it is necessary for the Engineer to perform the work, the Contractor shall pay the actual cost for the performance thereof. Such amount will be deducted from the Contractor's payment. This will be in addition to any penalties imposed in these special provisions.

The provisions in this section will not relieve the Contractor from his responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.04, "Public Safety," of the Standard Specifications.

#### 12-4.02D Payment

The Department pays for change order work for a traffic control system by force account for increased traffic control and uses a force account analysis for decreased traffic control.

Traffic control system for lane closure is paid for as traffic control system. Flagging costs are paid for as specified in section 12-1.04.

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

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

### 12-4.03 FALSEWORK OPENINGS

Reserved

### **12-4.04 PEDESTRIAN FACILITIES**

#### 12-4.04A General

Section 12-4.04 includes specifications for providing temporary pedestrian facilities.

Temporary pedestrian facilities must comply with section 16-2.02.

#### 12-4.04B Materials

Not Used

#### 12-4.04C Construction

If pedestrian traffic is allowed to pass through work areas, provide a temporary pedestrian facility through the construction areas within the highway. Include a protective overhead covering as necessary to ensure protection from falling objects and drippings from overhead structures.

If an activity requires a closure of a walkway, provide another walkway nearby, off of the traveled way.

Where pedestrian openings through falsework are required, provide a temporary pedestrian facility with a protective overhead covering during all bridge construction activities.

#### 12-4.04D Payment

Not Used

#### 12-4.06-12-4.10 RESERVED

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## **13 WATER POLLUTION CONTROL**

#### Replace 13-1.01A with:

#### 13-1.01A Summary

Section 13-1 includes general specifications for preventing, controlling, and abating water pollution within waters of the State.

Information on forms, reports, and other documents is in the following Caltrans manuals:

- 1. Field Guide to Construction Site Dewatering
- 2. Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual

- 3. Construction Site Best Management Practices (BMPs) Manual
- 4. Construction Site Monitoring Program Guidance Manual

You may view these manuals at the Stormwater and Water Pollution Control Information link at the Caltrans Division of Construction website or purchase them at the Caltrans Publication Distribution Unit.

A WPCP and a SWPPP must comply with the Caltrans Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual and must be prepared using the latest template posted on the Construction stormwater website.

#### Replace Section 13-1.01D92) with

## 13-1.01D(2) Regulatory Requirements

Comply with the discharge requirements in the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities; Order No. 2009-000 9-DWQ, CAS000002 (Construction General Permit) and any amendments thereto issued by the SWRCB. The Construction General Permit may be found at:

http://www.waterboards.ca.gov/water\_issues/programs/stormwater/constpermits.shtml

Discharges from manufacturing facilities, such as batch plants and crushing plants, must comply with the discharge requirements in the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities; Order No. 2014-0057-DWQ, CAS000001 (Industrial General Permit), issued by the SWRCB. For the Industrial General Permit, go to the SWRCB website.

For a batch plant and crushing plant outside a job site or within a job site that serves one or more contracts, obtain coverage under the Industrial General Permit before operating a batch plant to manufacture concrete, HMA, or other material or a crushing plant to produce rock or aggregate.

This Project disturbs less than 1 acres of soil.

## Replace Section 13-1.01D(4)(b) with:

## 13-1.01D(4)(b) Qualifications

The WPC manager must:

- 1. Comply with the requirements provided in the Construction General Permit for:
  - 1.1. QSP if the project requires a WPCP
  - 1.2. QSD if the project requires a SWPPP
- 2. Complete the stormwater management training described at the Stormwater and Water Pollution Control Information link at the Caltrans Division of Construction website

#### Add to the end of section 13-2.01A:

This project qualifies for an erosivity waiver because the anticipated soil disturbance is at least 1 and less than 5 ac and the R-factor is less than 5.

## Add between the 4th and 5th paragraphs of section 13-2.01C:

The Central Valley Regional Water Quality Control Board will review the authorized WPCP.

## Add to section 13-3.01A:

This project's risk level is 1.
#### Replace Section 13-3.01C(5) with:

#### 13-3.01C(5) Annual Certification

Submit an annual certification of compliance as described in the Caltrans *Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual* before July 15th of each year.

#### Replace Section 13-4.03G with:

#### 13-4.03G Dewatering

Dewatering consists of discharging accumulated stormwater, groundwater, or surface water from excavations or temporary containment facilities.

If dewatering is required, perform dewatering work as specified for the work items involved, such as a temporary ATS or dewatering and discharge.

If dewatering and discharging activities are not specified for a work item and you perform dewatering activities:

- 1. Conduct dewatering activities under the Caltrans Field Guide for Construction Site Dewatering.
- 2. Ensure any dewatering discharge does not cause erosion, scour, or sedimentary deposits that could impact natural bedding materials.
- 3. Discharge the water within the project limits. Dispose of the water if it cannot be discharged within project limits due to site constraints or contamination.
- 4. Do not discharge stormwater or nonstormwater that has an odor, discoloration other than sediment, an oily sheen, or foam on the surface. Immediately notify the Engineer upon discovering any such condition.

#### Replace Section 13-5.04 with:

#### 13-5.04 PAYMENT

The payment quantity for temporary soil stabilization bid items paid for by the area is the area measured parallel with the ground surface not including the additional quantity used for overlaps.

If there is no bid item for temporary soil stabilization, payment therefor is considered to be included in the bid item for prepare water pollution control program or in the bid item for prepare stormwater pollution prevention plan, as applicable.

#### 13-6.04 PAYMENT

#### Replace Section 13-6.04 with:

The payment quantity for temporary sediment control bid items paid for by the length is the length measured along the centerline of the installed material.

The payment quantity, if any, for temporary fiber roll does not include the additional quantity used for overlaps.

The Department does not pay for the relocation of temporary drainage inlet protection during work progress.

If there are no bid items for installing or maintaining temporary sediment control payment therefor is considered to be included in the bid item for prepare water pollution control program or in the bid item for prepare stormwater pollution prevention plan, as applicable.

#### Replace Section 13-7.03D with:

#### 13-7.03D Payment

The Department does not pay for the relocation of temporary construction entrances or roadways during work progress.

If there are no bid items for installing or maintaining temporary construction entrances or roadways, payment therefor is considered to be included in the bid item for prepare water pollution control program or in the bid item for prepare stormwater pollution prevention plan, as applicable.

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#### 14 ENVIRONMENTAL STEWARDSHIP

#### Add Section 14-12.04:

# 14-12.04 RELATIONS WITH SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT (SJVAPCD)

You are responsible for compliance with all applicable SJVAPCD regulations and requirements. This section is provided for your information, and nothing herein or elsewhere within these special provisions shall be construed as limiting your responsibility for complying with all applicable rules and regulations.

In accordance with SJVAPCD Regulation VIII – Fugitive PM10 Prohibitions: Rule 8021, implementation of an SJVAPCD-approved dust control plan is required prior to commencement of any dust generating activities. The County has filed a dust control plan with the SJVAPCD and has paid the application fee. A copy of the dust control plan filed by the County is included in "Project Details" of these special provisions.

Prepare and submit proposed modifications to the dust control plan to provide any information which is identified as "to be determined" on the dust control plan filed by the County and to modify the dust control plan to the extent necessary to accurately reflect your proposed operations. The Engineer completes the review within two working days after receipt thereof. In the event that the Engineer determines your submittal as incomplete or inadequate submit a corrected plan. The Engineer completes review of any resubmittal within two working days after receipt thereof.

Upon approval by the Engineer, submit the proposed modified dust control plan to the SJVAPCD. Pay to the SJVAPCD any fees which may be required for any modifications of the dust control plan. You are solely responsible for prompt preparation and submittal to the Engineer, and immediately upon approval by the Engineer, submittal to the SJVAPCD of all proposed modifications to the dust control plan.

Do not commence work until the SJVAPCD has approved or conditionally approved the dust control plan and the Engineer authorizes. When a modification to an approved dust control plan is under consideration do not perform work which is inconsistent with the approved dust control plan prior to receiving written approval.

Compensation for delays associated with review and approval of dust control plans is only considered in the event that: 1) the Engineer fails to review any modified dust control plan submitted by the Contractor within two working days after submittal thereof by the Contractor; or 2) the SJVAPCD fails to review and to either approve or disapprove a modified dust control plan within 30 calendar days after their receipt thereof. Disapproval of a proposed modification to the dust control plan by the Engineer or by the SJVAPCD shall not be considered as a basis for an extension of contract time nor as the basis for any additional compensation. Only in the event that it is determined by the Engineer that the Contractor was unreasonably delayed, through no fault of the Contractor, will compensation for delays be considered in conformance with the provisions in Section 8-1.07, "Delays," of the Standard Specifications.

It is your responsibility to be fully informed of the requirements of the Dust Control Plan and all rules, regulations, plans and conditions that may govern your operations and to conduct the work accordingly.

You must comply with the modifications to the Dust Control Plan approved by the SJVAPCD and accepted by the Engineer. Ensure the provisions of this section and SJVAPCD-approved modifications to the Dust Control Plan is made part of every subcontract executed pursuant to this contract.

Replace Section 14-12.04–14.12.08 With:

#### 14-12.05-14.12.08 RESERVED

#### ^^^^

### Replace section 37 with: 37 SEAL COATS 37-1 GENERAL

### 37-1.01 GENERAL

#### 37-1.01A Summary

Section 37-1 includes general specifications for applying seal coats.

#### 37-1.01B Definitions

Reserved

#### 37-1.01C Submittals

At least 10 days before the preconstruction meeting submit a list of participants in the preconstruction meeting. Provide each participant's name, employer, title, and role in the production and placement of the seal coats.

At least 10 days before starting seal coat activities, submit the names of the authorized laboratories for quality control testing.

For each delivery of asphalt binder or asphaltic emulsion to the job site, submit a certificate of compliance and a copy of the specified test results.

For a seal coat that uses crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of project.

#### 37-1.01D Quality Assurance

#### 37-1.01D(1) General

For aggregate testing, quality control laboratories must be in compliance with the Caltrans Independent Assurance Program to be an authorized laboratory. Quality control personnel must be qualified under the Caltrans Independent Assurance Program.

For emulsion testing, quality control laboratories must participate in the AASHTO Material's Reference Laboratory proficiency sample program.

#### 37-1.01D(2) Preconstruction Meeting

Hold a preconstruction meeting within 5 days before start of seal coat work at a mutually agreed time and place with the Engineer and your:

- 1. Project superintendent
- 2. Project foreman
- 3. Traffic control foreman

Make arrangements for the conference facility. Preconstruction meeting participants must sign an attendance sheet provided by the Engineer. Be prepared to discuss:

1. Quality control testing

- 2. Acceptance testing
- 3. Seal coat placement
- 4. Proposed application rates for asphaltic emulsion or asphalt binder and aggregate.
- 5. Training on placement methods
- 6. Checklist of items for proper placement
- 7. Unique issues specific to the project, including:
  - 7.1. Weather
  - 7.2. Alignment and geometrics
  - 7.3. Traffic control requirements
  - 7.4. Haul distances
  - 7.5. Presence and absence of shaded areas
  - 7.6. Any other local conditions
- 8. Contingency plan for material deliveries, equipment breakdowns, and traffic handling
- 9. Who in the field has authority to adjust application rates and how adjustments will be documented
- 10. Schedule of sweepings

#### 37-1.02 MATERIALS

Not Used

#### 37-1.03 CONSTRUCTION

#### 37-1.03A General

If seal coat activities affect access to public parking, residential property, or commercial property, post signs at 100-foot intervals on the affected streets. Signs must display *No Parking – Tow Away*. Signs must state the dates and hours parking or access will be restricted. Notify residents, businesses, and local agencies at least 24 hours before starting activities. The notice must:

- 1. Describe the work to be performed
- 2. Detail streets and limits of activities
- 3. Indicate dates and work hours
- 4. Be authorized

Asphaltic emulsion or asphalt binder for seal coats may be reheated if necessary. After loading the asphaltic emulsion or asphalt binder into a truck for transport to the job site, do not heat asphaltic emulsion above 160 degrees F and asphalt rubber binder above 425 degrees F. During reheating, circulate or agitate the asphaltic emulsion or asphalt binder to prevent localized overheating.

Except for fog seals, apply quick setting Grade 1 asphaltic emulsions at a temperature from 75 to 130 degrees F and apply quick setting Grade 2 asphaltic emulsions at a temperature from 110 to 185 degrees F.

You determine the application rates for asphaltic emulsion or asphalt binder and aggregate and the Engineer authorizes the application rates.

#### 37-1.03B Equipment

A self-propelled distributor truck for applying asphaltic emulsion or asphalt binder must be equipped with:

- 1. Pressure-type system with insulated tanks with circulating unit
- 2. Spray bars:
  - 2.1. With minimum length of 9 feet and full-circulating type
  - 2.2. With full-circulating-type extensions if needed to cover a greater width
  - 2.3. Adjustable to allow positioning at various heights above the surface to be treated
  - 2.4. Operated by levers such that 1 or all valves may be quickly opened or closed in one operation
- 3. Devices and charts to provide for accurate and rapid determination and control of asphaltic emulsion or asphalt binder quantities being applied. Include an auxiliary wheel type meter that registers:
  - 3.1. Speed in ft/min
  - 3.2. Trip by count
  - 3.3. Total distance in feet

- 4. Distribution system:
  - 4.1. Capable of producing a uniform application of asphaltic emulsion or asphalt binder in controlled quantities ranging from 0.02 to 1 gal/sq yd of surface and at a pressure ranging from 25 to 75 psi
  - 4.2. Pumps that spray asphaltic emulsion or asphalt binder within 0.02 gal/sq yd of the set rate
  - 4.3. With a hose and nozzle for application of asphaltic emulsion to areas inaccessible to the spray bar
  - 4.4. With pressure gauges and a thermometer for determining temperatures of the asphaltic emulsion or asphalt binder

You may use cab-controlled valves for the application of asphaltic emulsion or asphalt binder. The valves controlling the flow from nozzles must act positively to provide a uniform unbroken application of asphaltic emulsion or asphalt binder.

Maintain distributor and storage tanks at all times to prevent dripping.

#### 37-1.04 PAYMENT

Not Used

#### 37-2 CHIP SEALS

#### 37-2.01 GENERAL

#### 37-2.01A General

#### 37-2.01A(1) Summary

Section 37-2.01 includes general specifications for applying chip seals.

#### 37-2.01A(2) Definitions

#### Reserved

#### 37-2.01A(3) Submittals

At least 15 days before starting placement of chip seal, submit:

- 1. Samples for:
  - 1.1. Asphaltic emulsion chip seal, four 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
  - 1.2. Polymer modified asphaltic emulsion chip seal, four 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
  - 1.3. Asphalt rubber binder chip seal, two 1-quart cans of base asphalt binder
  - 1.4. Asphalt rubber binder chip seal, five 1-quart cans of asphalt rubber binder
- 2. Asphaltic emulsion, polymer modified asphaltic emulsion, asphalt binder or asphalt rubber binder data as follows:
  - 2.1. Supplier and Type/Grade of asphaltic emulsion or asphalt binder
  - 2.2. Type of modifier used including polymer or crumb rubber or both
  - 2.3. Percent of crumb rubber, if used as modifier
  - 2.4. Copy of the specified test results for asphaltic emulsion or asphalt binder
- 3. 50 lb of uncoated aggregate
- 4. Aggregate test results for the following:
  - 4.1. Gradation
  - 4.2. Los Angeles Rattler
  - 4.3. Percent of crushed particles
  - 4.4. Flat and elongated particles
  - 4.5. Film stripping
  - 4.6. Cleanness value
  - 4.7. Durability
- 5. Vialit test results

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

| Quality characteristic                                 | Maximum reporting time allowance |
|--------------------------------------------------------|----------------------------------|
| Los Angeles Rattler loss (max, %)                      | 48 hours                         |
| Percent of crushed particles (min, %)                  | 48 hours                         |
| Flat and elongated particles (max by weight at 3:1, %) | 48 hours                         |
| Film stripping (max, %)                                | 48 hours                         |
| Durability (min)                                       | 48 hours                         |
| Gradation (percentage passing)                         | 48 hours                         |
| Cleanness value (min)                                  | 24 hours                         |
| Asphaltic emulsion spread rate (gal/sq yd)             | 24 hours                         |

Within 3 days after taking asphaltic emulsion or asphalt binder quality control samples, submit the authorized laboratory's test results.

37-2.01A(4) Quality Assurance

37-2.01A(4)(a) General

Reserved

#### 37-2.01A(4)(b) Quality Control

37-2.01A(4)(b)(i) General

Reserved

#### 37-2.01A(4)(b)(ii) Aggregate

All tests must be performed on uncoated aggregate except for film stripping which must be performed on precoated aggregate.

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

|                                                                                                        | -                        |                                                 |                            |
|--------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------|----------------------------|
| Quality characteristic                                                                                 | Test method              | Minimum<br>sampling<br>and testing<br>frequency | Location of sampling       |
| Los Angeles Rattler loss (max, %)<br>At 100 revolutions<br>At 500 revolutions                          | California Test<br>211   | 1st day of production                           | See California<br>Test 125 |
| Percent of crushed particles<br>Coarse aggregate (min, %)<br>One-fractured face<br>Two-fractured faces | AASHTO T 335<br>METHOD 1 | 1st day of production                           | See California<br>Test 125 |
| Fine aggregate (min, %)<br>(Passing No. 4 sieve and retained on No. 8 sieve)<br>One fractured face     | AASHTO T 335<br>METHOD 2 | 1st day of production                           | See California<br>Test 125 |
| Flat and elongated particles (max by weight at 3:1, %)                                                 | ASTM D4791               | 1st day of<br>production                        | See California<br>Test 125 |
| Film stripping (max, %)                                                                                | California Test<br>302   | 1st day of<br>production                        | See California<br>Test 125 |
| Durability (min)                                                                                       | California Test<br>229   | 1st day of<br>production                        | See California<br>Test 125 |
| Gradation (% passing)                                                                                  | California Test<br>202   | 2 per day                                       | See California<br>Test 125 |
| Cleanness value (min)                                                                                  | California Test<br>227   | 2 per day                                       | See California<br>Test 125 |

#### Aggregate Quality Control Requirements

#### 37-2.01A(4)(b)(iii) Chip Seals

For a chip seal, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

| <b>Chip Seal</b> | Quality | Control | Requirements |
|------------------|---------|---------|--------------|
|------------------|---------|---------|--------------|

| Quality characteristic                            | Test method            | Minimum sampling                   | Location of      |
|---------------------------------------------------|------------------------|------------------------------------|------------------|
|                                                   |                        | and testing frequency              | sampling         |
| Asphaltic emulsion binder spread rate (gal/sq yd) | California<br>Test 339 | 1 per day per<br>distributor truck | Pavement surface |

#### 37-2.01A(4)(c) Department Acceptance

Department Acceptance shall not apply to identified areas where the existing surfacing before application of chip seal, contains defective areas as determined by the Engineer and Contractor. At least 7 days before starting placement of the chip seal, the Contractor shall submit a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway post mile locations, and defect type. The Engineer must agree on which of the identified areas are defective.

Defective areas are defined as one of the following:

- 1. Areas with wheel path rutting in excess of 3/8 inch when measured by placing a straightedge 12 feet long on the finished surface perpendicular to the center line and measuring the vertical distance between the finished surface and the lower edge of the straightedge
- 2. Areas exhibiting flushing

For a chip seal, acceptance is based on visual inspection for the following:

1. Uniform surface texture

- 2. Raveling, which consists of the separation of the aggregate from the asphaltic emulsion or asphalt binder
- 3. Flushing, which consists of the occurrence of a film of asphaltic material on the surface of the chip seal.
- 4. Streaking, which consists of alternating longitudinal bands of asphaltic emulsion or asphalt binder without uniform aggregate retention, approximately parallel with the lane line.

Areas of raveling, flushing or streaking that are greater than 0.5 sq ft shall be considered defective and must be repaired.

Raveling and streaking must be repaired by placing an additional layer of chip seal over the defective area.

For asphaltic emulsion or asphalt binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

For aggregate, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                            | Test method         | Requirements           |
|---------------------------------------------------|---------------------|------------------------|
| Los Angeles Rattler loss (max, %)                 |                     |                        |
| At 100 revolutions                                | California Test 211 | 10                     |
| At 500 revolutions                                |                     | 40                     |
| Percent of crushed particles:                     | AASHTO T 335        |                        |
| Coarse aggregate (min, %)                         | Method 1            |                        |
| One-fractured face                                |                     | 95                     |
| Two-fractured faces                               |                     | 90                     |
|                                                   |                     |                        |
|                                                   |                     |                        |
|                                                   |                     |                        |
| Fine aggregate (min, %)                           | AASHTO T 335        |                        |
| (Passing No. 4 sieve and retained on No. 8 sieve) | Method 2            |                        |
| One fractured face                                |                     | 70                     |
|                                                   |                     |                        |
|                                                   |                     |                        |
|                                                   |                     |                        |
| Flat and elongated particles (max by weight at    | ASTM D4791          |                        |
| 3:1, %)                                           |                     |                        |
|                                                   |                     |                        |
|                                                   |                     |                        |
|                                                   |                     | 10                     |
| Film stripping (max, %)                           | ASTM D4791          | 25                     |
| Durability (min)                                  | California Test 302 | 52                     |
| Gradation (% passing by weight)                   | California Test 229 | 52                     |
| Cleanness value (min)                             | California Test 202 | Aggregate Gradation    |
|                                                   |                     | table shown under      |
|                                                   |                     | Materials for the chip |
|                                                   |                     | seal type specified.   |
|                                                   | California Test 227 | 80                     |

#### Chip Seal Aggregate Acceptance Criteria

If test results for the aggregate gradation do not comply with specifications, you may remove the chip seal represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the aggregate represented by the test results.

If test results for aggregate cleanness value do not comply with the specifications, you may remove the chip seal represented by these tests or you may request that the chip seal remain in place with a pay deduction corresponding to the cleanness value shown in the following table:

| Deduction   |  |  |  |
|-------------|--|--|--|
| None        |  |  |  |
| \$2.00 /ton |  |  |  |
| \$4.00 /ton |  |  |  |
| \$6.00 /ton |  |  |  |
|             |  |  |  |

#### **Chip Seal Cleanness Value Deductions**

If the aggregate cleanness value is less than 75, remove the chip seal.

#### 37-2.01B Materials

37-2.01B(1) General

Reserved

#### 37-2.01B(2) Asphaltic Emulsions and Asphalt Binders

Reserved

#### 37-2.01B(3) Aggregate 37-2.01B(3)(a) General

Aggregate must be broken stone, crushed gravel, or both.

Aggregate must comply with the requirements shown in the following table:

| Chip Seal Aggregate Requirements                       |                     |                        |  |
|--------------------------------------------------------|---------------------|------------------------|--|
| Quality characteristic                                 | Test method         | Requirements           |  |
| Los Angeles Rattler loss (max, %)                      |                     |                        |  |
| At 100 revolutions                                     | California Test 211 | 10                     |  |
| At 500 revolutions                                     |                     | 40                     |  |
| Percent of crushed particles                           | AASHTO T 335        |                        |  |
| Coarse aggregate (min, %)                              |                     |                        |  |
| One-fractured face                                     |                     | 95                     |  |
| Two-fractured faces                                    |                     | 90                     |  |
| Fine aggregate (min, %)                                |                     |                        |  |
| (Passing No. 4 sieve and retained on No. 8 sieve)      |                     |                        |  |
| One fractured face                                     |                     | 70                     |  |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791          | 10                     |  |
| Film stripping (max, %)                                | California Test 302 | 25                     |  |
| Durability (min)                                       | California Test 229 | 52                     |  |
| Gradation (% passing by weight)                        | California Test 202 | Aggregate Gradation    |  |
|                                                        |                     | table shown under      |  |
|                                                        |                     | Materials for the chip |  |
|                                                        |                     | seal type specified.   |  |
| Cleanness value (min)                                  | California Test 227 | 80                     |  |

#### Chip Seal Aggregate Requirements

The authorized laboratory must conduct the Vialit test using the proposed asphaltic emulsion or asphalt binder and aggregate for compliance with the requirements shown in the following table:

#### **Chip Retention Requirements**

| Quality characteristic                                                              | Test method                                                                            | Requirement |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------|
| Chip retention (%)                                                                  | Vialit test method for aggregate in chip seals,<br>French chip (Modified) <sup>a</sup> | 95          |
| The conholding any propholic higher much be within the field placement term proture |                                                                                        |             |

<sup>a</sup>The asphaltic emulsion or asphalt binder must be within the field placement temperature range and application rate during specimen preparation. For asphalt binder cure the specimen for first 2 hours at 100 °F.

#### 37-2.01C Construction

#### 37-2.01C(1) General

For chip seals on 2-lane, 2-way roadways, place a W8-7 (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along each side of the traveled way where aggregate is spread on a traffic lane and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign in each direction where traffic first encounters the loose aggregate, regardless of which lane the aggregate is spread on. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

For chip seals on freeways, expressways, and multilane conventional highways, place a W8-7, (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along the outside edge of the traveled way nearest to the lane worked on, at on ramps, and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign where the aggregate starts with respect to the direction of travel on that lane. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

Pilot cars must have cellular or radio contact with other pilot cars and personnel in the work zone. The maximum speed of the pilot cars convoying or controlling traffic through the traffic control zone must be 15 mph on 2-lane, two-way highways and 25 mph on multilane divided and undivided highways. Pilot cars must only use traffic lanes open to traffic.

On the days that closures are not allowed, you may use a moving closure to maintain the seal coat surface. The moving closure is only allowed during daylight hours when traffic will be the least inconvenienced and delayed. The Engineer determines the hours for the moving closure.

Maintain signs in place at each location until the final sweeping of the chip seal surface for that location is complete. Signs may be set on temporary portable supports with the W13-1 sign below the W8-7 sign or on barricades with the W13-1 sign alternating with the W8-7 sign.

Schedule chip seal activities so that the chip seals are placed on both lanes of the traveled way each work shift.

If traffic is routed over a surface where a chip seal application is intended, the chip seal must not be applied to more than half the width of the traveled way at a time, and the remaining width must be kept free of obstructions and open to traffic until the previously applied width is ready for traffic use.

Wherever maintenance sweeping of the chip seal surface is complete, place permanent traffic stripes and pavement markings within 10 days.

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the chip seal work completed that has not received permanent traffic stripes and pavement markings.

#### 37-2.01C(2) Equipment

Equipment for chip seals must include and comply with the following:

- 1. Aggregate haul trucks must have:
  - 1.1. Tailgate that discharge aggregate
  - 1.2. Device to lock onto the rear aggregate spreader hitch
  - 1.3. Dump bed that will not push down on the spreader when fully raised

- 1.4. Dump bed that will not spill aggregate on the roadway when transferred to the spreader hopper
- 1.5. Tarpaulin to cover precoated aggregate when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
- 2. Self-propelled aggregate spreaders must have:
  - 2.1. Aggregate hopper in the rear
  - 2.2. Belt conveyor that carries the aggregate to the front
  - 2.3. Spreading hopper capable of providing a uniform aggregate spread rate over the entire width of the traffic lane in 1 application.
- 3. Self-propelled power brooms must:
  - 3.1. Not be steel-tined brooms on emulsion chip seals
  - 3.2. Be capable of removing loose aggregate adjacent to barriers that prevent aggregate from being swept off the roadway, including curbs, gutters, dikes, berms, and railings
- 4. Pneumatic or foam filled rubber tired rollers must:
  - 4.1. Be an oscillating type at least 4 feet wide
  - 4.2. Be self-propelled and reversible
  - 4.3. Have tires of equal size, diameter, type, and ply
  - 4.4. Carry at least 3,000 lbs of load on each wheel
  - 4.5 Have tires with an air pressure of  $100 \pm 5$  psi or be foam filled

#### 37-2.01C(3) Surface Preparation

Before applying chip seals, cover manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after the application of the chip seal.

Immediately before applying chip seals, clean the surface to receive a chip seal by removing any extraneous material affecting adhesion of the chip seal with the existing surface and drying. Use self-propelled power brooms to clean the existing pavement.

#### 37-2.01C(4) Placement

#### 37-2.01C(4)(a) General

Schedule the operations so that chip seals are placed on both lanes of the traveled way each work shift. At the end of the work shift, the end of the chip seals on both lanes must generally match.

#### 37-2.01C(4)(b) Applying Asphaltic Emulsions or Asphalt Binders

Prevent spraying on existing pavement not intended for chip seals or on previously applied chip seals using a material such as building paper. Remove the material after use.

Align longitudinal joints between chip seal applications with designated traffic lanes.

For asphaltic emulsion or asphalt binder, overlap longitudinal joints by not more than 4 inches. You may overlap longitudinal joints up to 8 inches if authorized.

For areas not accessible to a truck distributor bar apply:

- 1. Asphaltic emulsions by hand spraying
- 2. Asphalt binders with a squeegee or other authorized means

You may overlap the asphaltic emulsion or asphalt binder applications before the application of aggregate at longitudinal joints.

Do not apply the asphaltic emulsion or asphalt binder unless there is sufficient aggregate at the job site to cover the asphaltic emulsion or asphalt binder.

Discontinue application of asphaltic emulsion or asphalt binder early enough to comply with lane closure requirements. Apply to 1 lane at a time and cover the lane width entirely in 1 operation.

# 37-2.01C(4)(c) Spreading Aggregates 37-2.01C(4)(c)(i) General

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading aggregate.

Spread aggregate within 10 percent of your determined rate.

Spread aggregate at a uniform rate over the full lane width in 1 application. Apply to 1 lane at a time.

Sweep excess aggregate at joints before spreading adjacent aggregate.

Operate the spreader at speeds slow enough to prevent aggregate from rolling over after dropping.

If the spreader is not moving, aggregate must not drop. If you stop spreading and aggregate drops, remove the excess aggregate before resuming activities.

#### 37-2.01C(4)(d) Finishing 37-2.01C(4)(d)(i) General

Remove piles, ridges, or unevenly distributed aggregate. Repair permanent ridges, bumps, streaks or depressions in the finished surface. Spread additional aggregate and roll if aggregate is picked up by rollers or vehicles.

Chip seal joints between adjacent applications of a chip seal must be smooth, straight, uniform, and completely covered.

A coverage is 1 roller movement over the entire width of lane. A pass is 1 roller movement parallel to the chip seal application in either direction. Overlapping passes are part of the coverage being made and are not part of a subsequent coverage. Do not start a new coverage until completing the previous coverage.

Before opening to traffic, finish the chip seals in the following sequence:

- 1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
- 2. Perform final rolling consisting of 2 coverages with a pneumatic-tired roller
- 3. Sweep excess aggregate from the roadway and adjacent abutting areas
- 4. Apply a flush coat
- 5. Remove covers from the facilities

#### 37-2.01C(4)(d)(ii) Traffic Control With Pilot Car

For 2-lane 2-way roadways under 1-way traffic control, upon completion of final rolling and flush coat application, traffic must be controlled with pilot cars and routed over the new chip seal for a period of 2 to 4 hours before opening the lane to traffic not controlled with pilot cars.

For multilane roadways, when traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to traffic. Traffic must be controlled with pilot cars and be routed on the new chip seal surface of the lane for a minimum of 2 hours after completion of the initial sweeping and before opening the lane to traffic not controlled with pilot cars. Once traffic controlled with pilot cars is routed over the chip seal at a particular location, continuous control must be maintained at that location until the chip seal placement and sweeping on adjacent lanes to receive a chip seal is completed.

#### 37-2.01C(4)(d)(iii) Sweeping

Sweeping must be performed after the chip seal has set and there is no damage or dislodging of aggregate from the chip seal surface. As a minimum, sweeping is required at the following times:

- 1. On 2-lane 2-way roadways, from 2 to 4 hours after traffic, controlled with pilot cars, has been routed on the chip seal
- 2. On multilane roadways, from 2 to 4 hours after aggregate have been placed
- 3. In addition to previous sweeping, perform final sweeping immediately before opening any lane to public traffic, not controlled with pilot cars

#### 37-2.01C(4)(d)(iv) Excess Aggregate

Dispose of excess aggregate. If ordered, salvaging and stockpiling of excess aggregate is change order work.

#### 37-2.01C(4)(e) Chip Seal Maintenance

Perform sweeping on the morning following the application of aggregate on any lane that has been open to traffic not controlled with pilot cars and before starting any other activities.

Chip seal surfaces must be maintained for 4 consecutive days from the day aggregate is applied. Maintenance must include sweeping to maintain a surface free of loose aggregate and to prevent formation of corrugations. Sweeping must not dislodge aggregate set in asphaltic emulsion or asphalt binder.

After 4 consecutive days, excess aggregate must be removed from the paved areas.

#### 37-2.01D Payment

If there is no bid item for traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the chip seal.

The payment quantity for precoated aggregate is the weight measured after the aggregate is preheated and precoated with asphalt binder.

If recorded batch weights are printed automatically, the payment quantity for aggregate is the weight determined from the printed batch weights if:

- 1. Total weight for the precoated aggregate per batch is printed
- 2. Total asphalt binder weight per batch is printed
- 3. Zero tolerance weight is printed before weighing the first batch and after weighing the last batch for each truckload
- 4. Time, date, mix number, load number, and truck identification are correlated with a load slip
- 5. Copy of the recorded batch weights is certified by a licensed weighmaster

#### 37-2.03 POLYMER MODIFIED ASPHALTIC EMULSION CHIP SEALS

#### 37-2.03A General

#### 37-2.03A(1) Summary

Section 37-2.03 includes specifications for applying polymer modified asphaltic emulsion chip seals. A polymer modified asphaltic emulsion chip seal includes applying a polymer modified asphaltic emulsion, followed by aggregate, and then a flush coat.

A double polymer modified asphaltic emulsion chip seal is the application of a polymer modified asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

#### 37-2.03A(2) Definitions

Reserved

#### 37-2.03A(3) Submittals

Immediately after sampling, submit two 4-quart cans of polymer modified asphaltic emulsion taken in the presence of the Engineer. A sample must be submitted in an insulated shipping container.

#### 37-2.03A(4) Quality Assurance

37-2.03A(4)(a) General Reserved

37-2.03A(4)(b) Quality Control 37-2.03A(4)(b)(i) General Reserved

#### 37-2.03A(4)(b)(ii) Polymer Modified Asphaltic Emulsions

Circulate polymer modified asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 4-quart samples for acceptance testing.

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| Quality characteristic                           | Test method         | Minimum<br>sampling<br>and testing<br>frequency | Sampling<br>location |  |
|--------------------------------------------------|---------------------|-------------------------------------------------|----------------------|--|
| Saybolt Furol Viscosity, at 50 °C (Saybolt Furol |                     |                                                 |                      |  |
| seconds)                                         |                     |                                                 |                      |  |
| Settlement, 5 days (max, %)                      |                     |                                                 | Distributor          |  |
| Storage stability test, 1 day (max, %)           | AASHTO T 59         | Minimum 1                                       |                      |  |
| Sieve test (max, %)                              |                     | per day per                                     | Distributor          |  |
| Demulsibility (min, %)                           |                     | delivery truck                                  | liuck                |  |
| Particle charge                                  |                     |                                                 |                      |  |
| Ash content (max, %)                             | ASTM D3723          |                                                 |                      |  |
| Residue by evaporation (min, %)                  | California Test 331 |                                                 |                      |  |
| Tests on residue from evaporation test:          |                     |                                                 |                      |  |
| Penetration, 25 °C                               | AASHTO T 49         |                                                 |                      |  |
| Penetration, 4 °C, 200g for 60 seconds           | AASHTO T 49         | Minimum 1                                       | Distributor          |  |
| Ductility, 25 °C (min, mm)                       | AASHTO T 51         | per day per                                     | Distributor          |  |
| Torsional recovery (min, %)                      | California Test 332 | delivery truck                                  |                      |  |
| Ring and Ball Softening Point (min, °F)          | AASHTO T 53         |                                                 |                      |  |

#### **Polymer Modified Asphaltic Emulsion**

#### 37-2.03A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                      | Test method     | R      | equirement |       |
|---------------------------------------------|-----------------|--------|------------|-------|
| Gradation (% passing by weight) Sieve size: |                 | 3/8"   | 5/16"      | 1/4"  |
| 3/4"                                        |                 |        |            |       |
| 1/2"                                        |                 | 100    |            |       |
| 3/8"                                        | California Test | 85–100 | 100        | 100   |
| No. 4                                       | 202             | 0–15   | 0–50       | 60–85 |
| No. 8                                       |                 | 0–5    | 0–15       | 0–25  |
| No. 16                                      |                 |        | 0–5        | 0–5   |
| No. 30                                      |                 |        | 0–3        | 0–3   |
| No. 200                                     |                 | 0–2    | 0–2        | 0–2   |

#### Aggregate Gradation Acceptance Criteria

#### 37-2.03B Materials

#### 37-2.03B(1) General

Reserved

#### 37-2.03B(2) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must include elastomeric polymer.

A polymer modified asphaltic emulsion must be Grade PMCRS-2h. Polymer content in percent by weight does not apply.

A polymer modified asphaltic emulsion must comply with section 94 and the quality characteristic requirements in the following table:

| Quality characteristic                       | Test method | Requirement |  |  |  |
|----------------------------------------------|-------------|-------------|--|--|--|
| Penetration, 4 °C, 200g for 60 seconds (min) | AASHTO T 49 | 6           |  |  |  |
| Ring and Ball Softening Point (min, °F)      | AASHTO T 53 | 135         |  |  |  |

#### **Polymeric Asphaltic Emulsion**

#### 37-2.03B(3) Aggregate

#### The aggregate gradation shall meet 3/8" gradation requirement.

The aggregate gradation for a polymer modified asphaltic emulsion chip seal must comply with the requirements shown in the following table:

| Quality characteristic                           | Test method     |        | Requirement |       |
|--------------------------------------------------|-----------------|--------|-------------|-------|
| Gradation (% passing<br>by weight)<br>Sieve Size |                 | 3/8"   | 5/16"       | 1/4"  |
| 3/4"                                             |                 |        |             |       |
| 1/2"                                             | Colifornia Toot | 100    |             |       |
| 3/8"                                             | Calliornia Test | 85–100 | 100         | 100   |
| No. 4                                            | 202             | 0–15   | 0–50        | 60–85 |
| No. 8                                            |                 | 0–5    | 0–15        | 0–25  |
| No. 16                                           |                 |        | 0–5         | 0–5   |
| No. 30                                           |                 |        | 0–3         | 0–3   |
| No. 200                                          |                 | 0–2    | 0–2         | 0–2   |

#### Asphaltic Emulsion Chip Seal Aggregate Gradation

#### 37-2.03C Construction

Polymer modified asphaltic emulsions must be applied within the application rate ranges shown in the following table:

| Aggregate gradation | Application rate range |
|---------------------|------------------------|
|                     | (gal/sq yd)            |
| 3/8"                | 0.30–0.45              |
| 5/16"               | 0.25–0.35              |
| 1/4"                | 0.20-0.30              |

#### Polymer Modified Asphaltic Emulsion Application Rates

For double polymer modified asphaltic emulsion chip seals, polymer modified asphaltic emulsions must be applied within the application rates shown in the following table:

| i erymer meanea / ephane |                        |
|--------------------------|------------------------|
| Double application       | Application rate range |
|                          | (gal/sq yd)            |
| 1st application          | 0.30–0.45              |
| 2nd application          | 0.20-0.30              |

#### **Polymer Modified Asphaltic Emulsion Application Rates**

Apply polymer modified asphaltic emulsions when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply polymer modified asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

Aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate Spread Nates |                   |  |  |  |  |  |  |
|------------------------|-------------------|--|--|--|--|--|--|
| Chip seal type         | Spread rate range |  |  |  |  |  |  |
|                        | (lb/sq yd)        |  |  |  |  |  |  |
| 3/8"                   | 20–30             |  |  |  |  |  |  |
| 5/16"                  | 16–25             |  |  |  |  |  |  |
| 1/4"                   | 12–20             |  |  |  |  |  |  |

#### Aggregate Spread Rates

For double chip seals, aggregate must be spread within spread rate ranges shown in the following table:

| Aggregate Spread Kates |                   |  |  |  |  |  |  |
|------------------------|-------------------|--|--|--|--|--|--|
| Double application     | Spread rate range |  |  |  |  |  |  |
|                        | (lb/sq yd)        |  |  |  |  |  |  |
| 1st application        | 23–30             |  |  |  |  |  |  |
| 2nd application        | 12–20             |  |  |  |  |  |  |

#### Aggregate Spread Rates

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for the polymer modified asphaltic emulsion chip seals if you prevent contamination. Aggregate must have damp surfaces at spreading. If water visibly separates from the aggregate, do not spread. You may redampen aggregate in the delivery vehicle.

Spread aggregate before the polymer modified asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

#### 37-2.03D Payment

Not Used

#### ^^^^

#### 37-4.03 FLUSH COATS

### 37-4.03A General

#### 37-4.03A(1) Summary

Section 37-4.03 includes specifications for applying flush coats.

Use SS-1h slow setting asphaltic emulsion for flush coat.

Applying a flush coat includes applying a fog seal coat followed by sand.

#### 37-4.03A(2) Definitions

Reserved

#### 37-4.03A(3) Submittals

At least 15 days before use, submit:

- 1. Proposed target X values for sand gradation.
- 2. Gradation test results for sand

Submit quality control test results for sand gradation within 2 business days of sampling.

#### 37-4.03A(4) Quality Assurance 37-4.03A(4)(a) General

Reserved

#### 37-4.03A(4)(b) Quality Control

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

#### Sand Quality Control

| Quality characteristic          | Test method            | Minimum sampling<br>and testing frequency | Location of<br>sampling    |
|---------------------------------|------------------------|-------------------------------------------|----------------------------|
| Gradation (% passing by weight) | California Test<br>202 | 1 per day                                 | See California<br>Test 125 |

#### 37-4.03A(4)(c) Department Acceptance

Flush coat acceptance is based on fog seal acceptance and the following:

- 1. Visual inspection for uniform application of sand.
- 2. Sand acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

#### Sand Gradation Acceptance Criteria

| Gradation (% passing by weight)<br>Sieve size:                                                     | Quality characteristic                                                                                                      | Test method         | Requirement |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
| 3/8" 100   No. 4 93–100   No. 8 61–99   No. 16 X ± 13   No. 30 X ± 12   No. 50 X ± 9   No.100 1–15 | Gradation (% passing by weight)<br>Sieve size:<br>3/8"<br>No. 4<br>No. 8<br>No. 16<br>No. 30<br>No. 50<br>No.100<br>No. 200 | California Test 202 |             |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

#### 37-4.03B Material

#### 37-4.03B(1) General

Reserved

#### 37-4.03B(2) Sand

Sand must be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.

Sand for a flush coat must comply with the gradations shown in the following table:

| Sand Gradation                  |                     |             |  |  |  |  |  |  |
|---------------------------------|---------------------|-------------|--|--|--|--|--|--|
| Quality characteristic          | Test method         | Requirement |  |  |  |  |  |  |
| Gradation (% passing by weight) |                     |             |  |  |  |  |  |  |
| 3/8"                            |                     | 100         |  |  |  |  |  |  |
| No. 4                           |                     | 93–100      |  |  |  |  |  |  |
| No. 8                           | California Test 202 | 61–99       |  |  |  |  |  |  |
| No. 16                          | California Test 202 | X ± 13      |  |  |  |  |  |  |
| No. 30                          |                     | X ± 12      |  |  |  |  |  |  |
| No. 50                          |                     | X ± 9       |  |  |  |  |  |  |
| No.100                          |                     | 1–15        |  |  |  |  |  |  |
| No. 200                         |                     | 0–10        |  |  |  |  |  |  |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

Fine aggregate sizes must be distributed such that the difference between the total percentage passing the No. 16 and No. 30 sieves is from 10 to 40, and the difference between the percentage passing the No. 30 and No. 50 sieves is from 10 to 40.

#### 37-4.03C Construction

#### 37-4.03C(1) General

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after applying asphaltic emulsions.

Spread sand aggregate with a mechanical device that spreads sand at a uniform rate over the full width of a traffic lane in a single application. Spread sand at a rate from 2 to 6 lb/sq yd. You determine the application rates for sand and the Engineer authorizes the application rate.

#### 37-4.03C(2) Sweeping

Sweep loose sand material remaining on the surface 24 hours after application.

#### 37-4.03D Payment

The Department does not adjust the unit price for an increase or decrease in the sand cover (seal) quantity.

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## **DIVISION IX TRAFFIC CONTROL DEVICES**

#### 82 SIGNS AND MARKERS

#### Replace Section 82-1.01A with:

#### 82-1.01A Summary

Section 82-1 includes general specifications for fabricating and installing sign panels and markers and constructing roadside signs.

Signs and markers must comply with the *California MUTCD*, *California Sign Specifications*, and the FHWA publication *Standard Highway Signs and Markings*. For the *California Sign Specifications*, go to the Caltrans Traffic Operations website.

#### ^^^^

#### **84 MARKINGS**

#### Add to Section 84-1.03

Before obliterating any pavement delineation (traffic stripes, pavement markings, and pavement markers) that is to be replaced on the same alignment and location, as determined by the Engineer, the pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall include the limits or changes in striping pattern, including one- and 2-way barrier lines, limit lines, crosswalks and other pavement markings. Full compensation for referencing existing pavement delineation shall be considered as included in the contract prices paid for various items of work and no additional compensation will be allowed.

The Contractor shall protect pedestrian crosswalks, stop bars, and rumble bars from damage or displacement, unless otherwise directed by the Engineer.

Replace or repair facilities, which are damaged with your operation, at your expense.

#### Add to the list in the 1st paragraph of section 84-2.01C:

4. Material data sheet for thermoplastic primer

#### Replace the list in the1st paragraph of section 84-2.03C(2)(a) with:

- 1. To all roadway surfaces except for asphaltic surfaces less than 6 months old
- 2. At a minimum rate of 1 gallon per 300 square feet
- 3. To allow time for the thermoplastic primer to dry and become tacky prior to application of the thermoplastic

## Replace 0.20 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(b) with:

0.36 lb of thermoplastic per foot of 6-inch-wide solid stripe

# Replace 0.13 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(c) with:

0.24 lb of thermoplastic per foot of 6-inch-wide solid stripe

# Replace 0.38 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(e) with:

0.57 lb of thermoplastic per foot of 6-inch-wide solid stripe

**Replace** *4-inch-wide yellow stripes* at each occurrence in section 84-2.03C(3)(a) with: 6-inch-wide yellow stripes

**Replace** *4-inch-wide yellow stripes* at each occurrence in section 84-2.04 with: 6-inch-wide yellow stripes

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## **DIVISION XI MATERIALS**

### 92 ASPHALT BINDERS

#### Replace 92-1.01D(2) With:

#### 92-1.01D(2) Certification

Asphalt binder suppliers must comply with the Caltrans Certification Program for Suppliers of Asphalt. For a copy of the certification program, go to the METS website.

#### Replace Section 92-1.02B With

#### 92-1.02B Performance Grade Asphalt Binders

PG asphalt binder must comply with the requirements shown in the following table:

|                                     | Teet                   | •                      | R               | equireme        | nt              |                 |  |
|-------------------------------------|------------------------|------------------------|-----------------|-----------------|-----------------|-----------------|--|
| Quality characteristic              | I est                  | PG                     | PG              | PG              | PG              | PG              |  |
| method 58-22 <sup>a</sup> 64-10     |                        | 64-10                  | 64-16           | 64-28           | 70-10           |                 |  |
| Original Binder                     |                        |                        |                 |                 |                 |                 |  |
| Flash point (min, °C)               | AASHTO                 | 230                    | 230             | 230             | 230             | 230             |  |
|                                     | T 48                   |                        |                 |                 |                 |                 |  |
| Solubility <sup>b</sup> (min, %)    | AASHTO                 | 99                     | 99              | 99              | 99              | 99              |  |
|                                     | T 44                   |                        |                 |                 |                 |                 |  |
| Viscosity at 135 °C <sup>c</sup>    | AASHTO                 |                        |                 |                 |                 |                 |  |
| (max, Pa•s)                         | T 316                  | 3.0                    | 3.0             | 3.0             | 3.0             | 3.0             |  |
| Dynamic shear                       |                        |                        |                 |                 |                 |                 |  |
| Test temperature at 10              |                        |                        |                 |                 |                 |                 |  |
| rad/s (°C)                          | T 315                  | 58                     | 64              | 64              | 64              | 70              |  |
| G*/sin(delta) (min, kPa)            | 1 515                  | 1.00                   | 1.00            | 1.00            | 1.00            | 1.00            |  |
| G*/sin(delta) (max, kPa)            |                        | 2.00                   | 2.00            | 2.00            | 2.00            | 2.00            |  |
| RTFO <sup>f</sup> test <sup>e</sup> | AASHTO                 |                        |                 |                 |                 |                 |  |
| mass loss (max, %)                  | T 240                  | 1.00                   | 1.00            | 1.00            | 1.00            | 1.00            |  |
|                                     | RTFO                   | f Test Aged            | Binder          |                 |                 |                 |  |
| Dynamic shear                       |                        |                        |                 |                 |                 |                 |  |
| Test temperature at 10              | AASHTO                 |                        |                 |                 |                 |                 |  |
| rad/s (°C)                          | T 315                  | 58                     | 64              | 64              | 64              | 70              |  |
| G*/sin(delta) (min, kPa)            |                        | 2.20                   | 2.20            | 2.20            | 2.20            | 2.20            |  |
| Ductility at 25 °C (min, cm)        | AASHTO                 |                        |                 |                 |                 |                 |  |
|                                     | T 51                   | 75                     | 75              | 75              | 75              | 75              |  |
| PAV <sup>g</sup>                    | AASHTO                 |                        |                 |                 |                 |                 |  |
| Test temperature (°C)               | R 28                   | 100                    | 100             | 100             | 100             | 110             |  |
|                                     | RTFO <sup>f</sup> Test | t and PAV <sup>g</sup> | Aged Binder     |                 |                 |                 |  |
| Dynamic shear,                      |                        |                        |                 |                 |                 |                 |  |
| Test temperature at 10              | AASHTO                 |                        |                 |                 |                 |                 |  |
| rad/s (°C)                          | T 315                  | 22 <sup>d</sup>        | 31 <sup>d</sup> | 28 <sup>d</sup> | 22 <sup>d</sup> | 34 <sup>d</sup> |  |
| G*sin(delta) (max, kPa)             |                        | 5000                   | 5000            | 5000            | 5000            | 5000            |  |
| Creep stiffness,                    |                        |                        |                 |                 |                 |                 |  |
| Test temperature, °C                | AASHTO                 | -12                    | 0               | -6              | -18             | 0               |  |
| S-value (max, MPa)                  | T 313                  | 300                    | 300             | 300             | 300             | 300             |  |
| M-value (min)                       |                        | 0.300                  | 0.300           | 0.300           | 0.300           | 0.300           |  |

#### PG Asphalt Binders

<sup>a</sup>Use as asphalt rubber base stock for high mountain and high desert area.

<sup>b</sup>The Engineer waives solubility requirements if the supplier is an authorized material source as defined by the Caltrans *Certification Program for Suppliers of Asphalt*.

<sup>c</sup>The Engineer waives this specification if the supplier provides written certification the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards. <sup>d</sup>Test the sample at 3 <sup>o</sup>C higher if it fails at the specified test temperature. G\*sin(delta) remains 5000 kPa maximum.

<sup>e</sup>The residue from mass change determination may be used for other tests.

<sup>f</sup>RTFO means rolling thin film oven.

<sup>9</sup>PAV means Pressure Aging Vessel.

PG modified asphalt binder must comply with the requirements shown in the following table:

|                                       |                                    | Requirement     |                 |                   |  |  |  |
|---------------------------------------|------------------------------------|-----------------|-----------------|-------------------|--|--|--|
| Quality characteristic                | Test method                        | PG              | PG              | PG                |  |  |  |
|                                       |                                    | 58-34 M         | 64-28 M         | 76-22 M           |  |  |  |
|                                       | Original Binder                    |                 |                 |                   |  |  |  |
| Flash point (min, °C)                 | AASHTO T 48                        | 230             | 230             | 230               |  |  |  |
| Solubility (min, %)                   | AASHTO T 44 <sup>a</sup>           | 97.5            | 97.5            | 97.5 <sup>b</sup> |  |  |  |
| Viscosity at 135 °C°                  |                                    |                 |                 |                   |  |  |  |
| (max, Pa•s)                           | AASHTOT316                         | 3.0             | 3.0             | 3.0               |  |  |  |
| Dynamic shear,                        |                                    |                 |                 |                   |  |  |  |
| Test temperature at 10                |                                    |                 |                 |                   |  |  |  |
| rad/s (°C)                            | AASITIO 1 313                      | 58              | 64              | 76                |  |  |  |
| G*/sin(delta) (min, kPa)              |                                    | 1.00            | 1.00            | 1.00              |  |  |  |
| RTFO <sup>g</sup> test <sup>d</sup> , | <b>ΔΔ SHTO T 240</b>               |                 |                 |                   |  |  |  |
| Mass loss (max, %)                    | 1.00                               | 1.00            | 1.00            |                   |  |  |  |
| RTFO <sup>g</sup> Test Aged Binder    |                                    |                 |                 |                   |  |  |  |
| Dynamic shear,                        |                                    |                 |                 |                   |  |  |  |
| Test temperature at 10                | AASHTO T 315                       |                 |                 |                   |  |  |  |
| rad/s (°C)                            |                                    | 58              | 64              | 76                |  |  |  |
| G*/sin(delta) (min, kPa)              |                                    | 2.20            | 2.20            | 2.20              |  |  |  |
| Dynamic shear,                        |                                    |                 |                 |                   |  |  |  |
| Test temperature at 10                | AASHTO T 315                       |                 |                 |                   |  |  |  |
| rad/s, °C                             |                                    |                 |                 |                   |  |  |  |
| Delta (max, degree)                   |                                    | 80 <sup>e</sup> | 80 <sup>e</sup> | 80 <sup>e</sup>   |  |  |  |
| Elastic recovery <sup>r</sup> ,       |                                    |                 |                 |                   |  |  |  |
| l est temperature (°C)                | AASHTOT 301                        | 25              | 25              | 25                |  |  |  |
| Recovery (min, %)                     |                                    | /5              | /5              | 65                |  |  |  |
|                                       | AASHTO R 28                        | 100             | 100             | 110               |  |  |  |
| I emperature (°C)                     |                                    | 100             | 100             | 110               |  |  |  |
| Dura envie als e e e                  | TFO <sup>9</sup> Test and PAV" Age | a Binder        | <u>т</u>        | 1                 |  |  |  |
| Dynamic snear,                        |                                    |                 |                 |                   |  |  |  |
| Test temperature at 10                | AASHTO T 315                       | 10              |                 |                   |  |  |  |
|                                       |                                    | 16              | 22              | 31                |  |  |  |
| Grsin(delta) (max, kPa)               |                                    | 5000            | 5000            | 5000              |  |  |  |
| Creep stiffness,                      |                                    | 24              | 10              | 10                |  |  |  |
| S volue (max, Mnc)                    | AASHTO T 313                       | -24             | -18             | -12               |  |  |  |
| S-value (max, wpa)                    |                                    |                 |                 | 0.200             |  |  |  |
|                                       |                                    | 0.300           | 0.300           | 0.300             |  |  |  |

#### **PG Modified Asphalt Binders**

<sup>a</sup>The Department allows ASTM D5546 or ASTM D7553 instead of AASHTO T 44. Particles recovered from ASTM D5546 or ASTM D7553 or AASHTO T 44 must be less than 250 µm. <sup>b</sup>Report only for spray application.

<sup>c</sup>The Engineer waives the viscosity requirements if the supplier provides written certification the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.

<sup>d</sup>The residue from mass change determination may be used for other tests.

<sup>e</sup>Test temperature is the temperature at which G\*/sin(delta) is 2.2 kPa. A graph of log G\*/sin(delta) plotted against temperature may be used to determine the test temperature when G\*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G\*/sin(delta) is 2.2 kPa. A graph of (delta) is 2.2 kPa. The graph must have at least 2 points that envelope G\*/sin(delta) of 2.2 kPa, and the test temperature must not be more than 6 degree C apart. The Engineer also accepts direct measurement of delta at the temperature when

G\*/sin(delta) is 2.2 kPa.

<sup>f</sup>Tests without a force ductility clamp may be performed.

<sup>g</sup>RTFO means rolling thin film oven.

<sup>h</sup>PAV means Pressure Aging Vessel.

Do not modify PG modified asphalt binder using polyphosphoric acid.

Crumb rubber must be from automobile and truck tires and must be free from contaminants including fabric, metal, minerals, and other nonrubber substances.

PG modified asphalt binder modified with crumb rubber must be homogeneous and must not contain visible particles of crumb rubber.

The supplier of PG modified asphalt binder modified with crumb rubber must:

- 1. Report the quantity of crumb rubber by weight of asphalt binder
- 2. Certify a minimum of 10 percent of crumb rubber by weight of asphalt binder

**Project Details** 

Contract Number 17-25-C

#### DEPARTMENT OF PUBLIC WORKS AND PLANNING

2017 / 2018 BITUMINOUS SEAL COATS

CONTRACT NO. 17-25-C

#### BASE BID - BITUMINOUS SEAL COATS

| NO.    | PROJECT           |          | IMITS             | LENGTH<br>(miles) | WIDTH<br>(feet) | SURFACE<br>AREA<br>(SY) | PMCRS-2h<br>EMULSION<br>(tons) | SCREENINGS<br>(3/8")<br>(tons) | FOG SEAL<br>EMULSION<br>(tons) | SAND<br>(tons) | COMMENTS |
|--------|-------------------|----------|-------------------|-------------------|-----------------|-------------------------|--------------------------------|--------------------------------|--------------------------------|----------------|----------|
| 1      | CHATEAU FRESNO    | ELKHORN  | MT WHITNEY        | 4.024             | 24.5            | 57,839                  | 81.0                           | 760.0                          | 16.0                           | 183.0          | ANS      |
| 2      | CEDAR             | ELKHORN  | MT WHITNEY        | 4.020             | 22              | 51,885                  | 73.0                           | 681.0                          | 14.0                           | 164.0          | ANS      |
| 3      | MARKS             | ELKHORN  | MT WHITNEY        | 4.009             | 24              | 56,447                  | 80.0                           | 741.0                          | 15.0                           | 178.0          | ANS      |
| 4      | JENSEN            | SR 145   | BUTTE             | 5.023             | 24              | 70,724                  | 100.0                          | 929.0                          | 19.0                           | 223.0          | ANS      |
| 5      | CRAWFORD          | MANNING  | FLORAL            | 2.000             | 24              | 28,160                  | 40.0                           | 370.0                          | 8.0                            | 89.0           | ANS      |
| 6      | CRAWFORD          | SR 180   | JENSEN            | 1.000             | 24              | 14,080                  | 20.0                           | 185.0                          | 4.0                            | 45.0           | ANS      |
| 7      | FOWLER            | AMERICAN | 0.125 S/O CLAYTON | 1.631             | 24              | 22,965                  | 33.0                           | 302.0                          | 7.0                            | 73.0           | ANS      |
| 8      | COVE              | SR 180   | JENSEN            | 0.741             | 24              | 10,434                  | 15.0                           | 137.0                          | 3.0                            | 33.0           | ANS      |
| 9      | SOUTH             | HIGHLAND | ACADEMY           | 3.980             | 24              | 56,039                  | 79.0                           | 736.0                          | 15.0                           | 177.0          | ANS      |
| 10     | MARKS             | SOUTH    | FLORAL            | 2.995             | 24              | 42,170                  | 60.0                           | 554.0                          | 12.0                           | 133.0          | ANS      |
| BASE E | D QUANTITY TOTALS |          |                   | 29.423            |                 | 410,743                 | 581.0                          | 5,395.0                        | 113.0                          | 1,298.0        |          |

ANS= Advance Notification Signs Install one week prior to starting work

ANS\*= Advance Notification Signs install two weeks prior to starting work

#### ADDITIVES 1A-2A

| NO. | PROJECT | L                      | IMITS                  | LENGTH<br>(miles) | WIDTH<br>(feet) | SURFACE<br>AREA (SY) | PMCRS-2h<br>EMULSION<br>(tons) | SCREENINGS<br>(3/8")<br>(tons) | FOG SEAL<br>EMULSION<br>(tons) | SAND<br>(tons) | COMMENTS |
|-----|---------|------------------------|------------------------|-------------------|-----------------|----------------------|--------------------------------|--------------------------------|--------------------------------|----------------|----------|
| 1   | AUBERRY | MILLERTON (WEST)       | GREEN MEADOW (PRIVATE) | 3.990             | 24              | 56,180               | 79.0                           | 738.0                          | 15.0                           | 177.0          | ANS      |
| 2   | AUBERRY | GREEN MEADOW (PRIVATE) | QUAIL HOLLOW (PRIVATE) | 4.518             | 24              | 63,614               | 90.0                           | 835.0                          | 17.0                           | 201.0          | ANS      |

#### TRAFFIC STRIPING AND PAVEMENT MARKING DETAILS

#### BITUMINOUS SEAL COATS - CONTRACT 17-25-C

|    | BASE BID QUANTITIES                     |         |         |             |             |              |              |              | STRIPING     | 3             |              |              |              |               | RF        | PM        |             |        | MARKING           | ;                  |             |
|----|-----------------------------------------|---------|---------|-------------|-------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|---------------|-----------|-----------|-------------|--------|-------------------|--------------------|-------------|
| ID | PROJECT - LIMITS                        | LENGTH  |         | DETAIL<br>5 | DETAIL<br>6 | DETAIL<br>18 | DETAIL<br>19 | DETAIL<br>21 | DETAIL<br>22 | DETAIL<br>27B | DETAIL<br>28 | DETAIL<br>29 | DETAIL<br>39 | DETAIL<br>39A | TYPE<br>D | TYPE<br>H | STOP<br>BAR | "STOP" | "STOP"<br>"AHEAD" | "YIELD"<br>"AHEAD" | RR<br>X-ING |
|    |                                         | (MILES) | (FEET)  | (LF)        | (LF)        | (LF)         | (LF)         | (LF)         | (LF)         | (LF)          | (LF)         | (LF)         | (LF)         | (LF)          | (EA)      | (EA)      | (SF)        | (SF)   | (SF)              | (SF)               | (SF)        |
| 1  | CHATEAU FRESNO - ELKHORN TO MT. WHITNEY | 4.024   | 21,247  | 18,847      |             | 2,400        |              |              |              |               |              |              |              |               |           |           | 24          |        | 106               |                    |             |
| 2  | CEDAR - ELKHORN TO MT. WHITNEY          | 4.020   | 21,226  | 18,226      |             | 3,000        |              |              |              |               |              |              |              |               |           |           | 24          |        | 106               |                    |             |
| 3  | MARKS - ELKHORN TO MT. WHITNEY          | 4.009   | 21,168  | 19,368      |             | 1,800        |              |              |              |               |              |              |              |               |           |           | 24          |        | 106               |                    |             |
| 4  | JENSEN - SR 145 TO BUTTE                | 5.023   | 26,522  | 22,722      |             | 3,400        |              |              |              | 4,000         | 200          | 200          |              |               | 18        |           |             |        |                   | 55                 |             |
| 5  | CRAWFORD - MANNING TO FLORAL            | 2.000   | 10,560  | 8,160       |             | 2,400        |              |              |              |               |              |              |              |               |           |           | 63          |        | 159               |                    |             |
| 6  | CRAWFORD - SR 180 TO JENSEN             | 1.000   | 5,280   | 4,680       |             | 600          |              |              |              |               |              |              |              |               |           |           | 15          |        | 106               |                    |             |
| 7  | FOWLER - AMERICAN TO 0.125 S/O CLAYTON  | 1.631   | 8,612   | 6,412       |             | 2,200        |              |              |              |               |              |              |              |               |           |           | 15          |        | 53                |                    |             |
| 8  | COVE - SR 180 TO JENSEN                 | 0.741   | 3,913   | 2,713       |             | 1,200        |              |              |              |               |              |              |              |               |           |           | 21          | 22     | 53                |                    |             |
| 9  | SOUTH - HIGHLAND TO ACADEMY             | 3.980   | 21,015  | 18,015      |             | 3,000        |              |              |              |               |              |              |              |               |           |           | 43          |        | 159               |                    |             |
| 10 | MARKS - SOUTH TO FLORAL                 | 2.995   | 15,814  | 12,614      |             | 3,200        |              |              |              |               |              |              |              |               |           |           | 24          |        | 106               |                    |             |
|    | BASE BID ITEM TOTALS:                   | 29.423  | 155,354 | 131,757     | 0           | 23,200       | 0            | 0            | 0            | 4,000         | 200          | 200          | 0            | 0             | 18        | 0         | 253         | 22     | 954               | 55                 | 0           |

|    | ADDITIVE BID QUANTITIES                    | STRIPING |         |      |         |      |         |      |         |      |        |        | RPM    |        | MARKING |        |        |         |         |        |      |      |      |        |        |         |    |
|----|--------------------------------------------|----------|---------|------|---------|------|---------|------|---------|------|--------|--------|--------|--------|---------|--------|--------|---------|---------|--------|------|------|------|--------|--------|---------|----|
|    |                                            | LEN      | I ENGTH |      | I ENGTH |      | I ENGTH |      | I ENGTH |      | DETAIL | DETAIL | DETAIL | DETAIL | DETAIL  | DETAIL | DETAIL | DETAIL  | DETAIL  | DETAIL | TYPE | TYPE | STOP | "STOP" | "STOP" | "YIELD" | RR |
| ID | PROJECT - LIMITS                           |          | 5       | 6    | 18      | 19   | 21      | 22   | 27B     | 28   | 29     | 39     | 39A    | D      | Н       | BAR    |        | "AHEAD" | "AHEAD" | X-ING  |      |      |      |        |        |         |    |
|    |                                            | (MILES)  | (FEET)  | (LF) | (LF)    | (LF) | (LF)    | (LF) | (LF)    | (LF) | (LF)   | (LF)   | (LF)   | (LF)   | (EA)    | (EA)   | (LF)   | (SF)    | (SF)    | (SF)   | (SF) |      |      |        |        |         |    |
| 1A | AUBERRY - MILLERTON (WEST) TO GREEN MEADOW | 3.990    | 21,067  |      |         |      | 1,214   |      | 19,626  |      |        | 227    | 42,134 |        | 1,740   | 370    |        |         |         |        |      |      |      |        |        |         |    |
| 2A | AUBERRY - GREEN MEADOW TO QUAIL HOLLOW     | 4.518    | 23,855  |      |         |      |         |      | 23,855  |      |        |        | 47,710 |        | 2,386   |        |        |         |         |        |      |      |      |        |        |         |    |

### TRAFFIC STRIPING AND PAVEMENT MARKING REMOVAL DETAILS

# **BITUMINOUS SEAL COATS - CONTRACT 17-25-C**

|    | BASE BID QUANTITIES                     |        |         |        |             |              | MARKING      |              |              |              |        |                   |                    |
|----|-----------------------------------------|--------|---------|--------|-------------|--------------|--------------|--------------|--------------|--------------|--------|-------------------|--------------------|
| ID | PROJECT - LIMITS                        |        | LENGTH  |        | DETAIL<br>6 | DETAIL<br>18 | DETAIL<br>19 | DETAIL<br>22 | DETAIL<br>28 | DETAIL<br>29 | "STOP" | "STOP"<br>"AHEAD" | "YIELD"<br>"AHEAD" |
|    |                                         |        | (FEET)  | (LF)   | (LF)        | (LF)         | (LF)         | (LF)         | (LF)         | (LF)         | (SF)   | (SF)              | (SF)               |
| 1  | CHATEAU FRESNO - ELKHORN TO MT. WHITNEY | 4.024  | 21,247  |        |             |              | ,            |              | · · · · ·    |              |        |                   |                    |
| 2  | CEDAR - ELKHORN TO MT. WHITNEY          | 4.020  | 21,226  |        |             |              |              |              |              |              |        |                   |                    |
| 3  | MARKS - ELKHORN TO MT. WHITNEY          | 4.009  | 21,168  |        |             |              |              |              |              |              |        |                   |                    |
| 4  | JENSEN - SR 145 TO BUTTE                | 5.023  | 26,522  | 22,722 |             | 3,400        |              |              | 200          | 200          |        |                   | 55                 |
| 5  | CRAWFORD - MANNING TO FLORAL            | 2.000  | 10,560  |        |             |              |              |              |              |              |        |                   |                    |
| 6  | CRAWFORD - SR 180 TO JENSEN             | 1.000  | 5,280   |        |             |              |              |              |              |              |        |                   |                    |
| 7  | FOWLER - AMERICAN TO 0.125 S/O CLAYTON  | 1.631  | 8,612   |        |             |              |              |              |              |              |        |                   |                    |
| 8  | COVE - SR 180 TO JENSEN                 | 0.741  | 3,913   |        |             |              |              |              |              |              | 22     |                   |                    |
| 9  | SOUTH - HIGHLAND TO ACADEMY             | 3.980  | 21,015  | 18,016 |             | 3,000        |              |              |              |              |        | 159               |                    |
| 10 | MARKS - SOUTH TO FLORAL                 | 2.995  | 15,814  |        |             |              |              |              |              |              |        |                   |                    |
|    | BASE BID ITEM TOTALS:                   | 29.423 | 155,354 | 40,738 | 0           | 6,400        | 0            | 0            | 200          | 200          | 22     | 159               | 55                 |

|    | BASE BID QUANTITIES                        |         |        | ç    | MARKING |        |        |        |        |        |        |         |         |
|----|--------------------------------------------|---------|--------|------|---------|--------|--------|--------|--------|--------|--------|---------|---------|
| ID |                                            |         |        |      | DETAIL  | DETAIL | DETAIL | DETAIL | DETAIL | DETAIL | "STOD" | "STOP"  | "YIELD" |
|    | PROJECT - LIMITS                           | LLINGTH |        | 5    | 6       | 18     | 19     | 22     | 28     | 29     | STOP   | "AHEAD" | "AHEAD" |
|    |                                            | (MILES) | (FEET) | (LF) | (LF)    | (LF)   | (LF)   | (LF)   | (LF)   | (LF)   | (SF)   | (SF)    | (SF)    |
| 1A | AUBERRY - MILLERTON (WEST) TO GREEN MEADOW | 3.990   | 21,067 |      |         |        | 1,214  | 19,626 |        | 227    |        |         |         |
| 2A | AUBERRY - GREEN MEADOW TO QUAIL HOLLOW     | 4.518   | 23,855 |      |         |        |        | 23,855 |        |        |        |         |         |
































5-19-17



5-19-17



3-13-17





9-22-15
| ۲, | 48 | L | Е | 1 |  |
|----|----|---|---|---|--|
|    |    |   |   |   |  |

|       | T.<br>CH      | APER LE<br>ANNELIZ | NGTH C     | RITERIA<br>VICE SP  | AND         |                        |                |
|-------|---------------|--------------------|------------|---------------------|-------------|------------------------|----------------|
|       | FOR W         | NINIMUN TA         | APER LENGT | 18<br>18<br>267 200 | MAXIM<br>De | UN CHANNE<br>VICE SPAC | L FZING<br>ING |
| SPEED |               |                    |            |                     | х           | Y                      | Z **           |
| (5)   | TANCENT<br>2L | MERGING            | SHIFTING   | SHOULDER            | TAPER       | TANGENT                | CONFLIC        |
| лph   | f #           | ft                 | 11         | ft                  | ft          | 11                     | ft             |
| 20    | 160           | 80                 | 40         | 27                  | 20          | 40                     | 10             |
| 25    | 250           | 125                | 63         | 42                  | 25          | 50                     | 12             |
| 30    | 360           | 180                | 90         | 60                  | 70          | 60                     | 15             |
| 35    | 490           | 245                | 123        | 82                  | 35          | 70                     | 17             |
| 40    | 640           | 320                | 160        | 107                 | 40          | 80                     | 20             |
| 45    | 1080          | 540                | 270 .      | 180                 | 45          | 90                     | 22             |
| 50    | 1200          | 600                | 300        | 200                 | 50          | 100                    | 25             |
| 55    | 1320          | 660                | 330        | 220                 | 50          | 100                    | 25             |
| 60    | 1440          | 720                | 360        | 240                 | 50          | 100                    | 25             |
| 65    | 1560          | 780                | 390        | 260                 | 50          | 100                    | 25             |
| 10    | 1680          | 840                | 420        | 280                 | 50          | 100                    | 25             |
| 75    | 1800          | 900                | 450        | 300                 | 50          | 100                    | 25             |
|       |               |                    |            |                     |             |                        |                |

# - for other offsets, use the following merging taper length formula for L: For speed of 40 mph or lens, L =  $wS^2/60$  For speed of 45 mph or more, L = wS

Where: L = Toper length in feet

.

W = Width of offact in feet

a - algin of grider in reet

S = Posted speed limit, off-pack 85th-parcentile speed prior to work storting, or the onticipated operating speed in mph

4# - Use for toper and tangent sections where there are no povement markings or where there is a conflict between existing povement markings and channelizers (CA).

| Γ, | AB | L | Ε | 2 |
|----|----|---|---|---|
|----|----|---|---|---|

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| LON    | GITUDINA<br>FLAGGER | L BUFFER | SPACE<br>SPACING | AND   |
|--------|---------------------|----------|------------------|-------|
|        |                     | DOW      | NGRADE Min       | нин С |
| SPEED* | Nin O <sup>HH</sup> | - 3%     | -6%              | - 9%  |
| mph    | £1                  | ft       | ft -             | ft    |
| 20     | 115                 | 115      | 120              | 126   |
| 25     | 155                 | 150      | 165              | 173   |
| 30     | 200                 | 205      | 215              | 227   |
| 35     | 250                 | 257      | 271              | 287   |
| 40     | 305                 | 315      | 333              | 354   |
| 45     | 360                 | 378      | 400              | 421   |
| 50     | 425                 | 446      | 474              | 507   |
| 55     | 495                 | 520      | 553              | 593   |
| 60     | 570                 | 598      | 638              | 686   |
| 65     | 645                 | 682      | 728              | 785   |
| 70     | 730                 | 771      | 825              | 891   |
| 75     | 820                 | 866      | 927              | 1003  |

\* - Speed is posted speed limit, off-peak Sth-percentile speed prior to work storting, or the onticipated operating speed in mph

XX - Longitudinal buffer space or flagger station spacing

\*\*\* Use an subtained downgrode steeper than -3 percent and longer than 1 mile.

s or where

#### TABLE 3

#### ADVANCE WARNING SIGN SPACING

|                                    | DISTANC | E BETWEE | SIGNS # |
|------------------------------------|---------|----------|---------|
| ROAD TYPE                          | A       | 6        | c C     |
|                                    | f1      | 11       | ft      |
| URBAN + 25 mph OR LESS             | 100     | 100      | 100     |
| URBAN - MORE THAN 25 Mph TO 40 mph | 250     | 250      | 250     |
| URBAN - NORE THAN 40 mph           | 350     | 350      | 350     |
| RURAL                              | 500     | 500      | 500     |
| EXPRESSWAY / FREEWAY               | 1000    | 1500     | 2640    |

N - The distances are opproximate, are intended for guidance purposes only, and should be applied with engineering judgment. Insee distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

> STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM TABLES For lane and ramp closures

NO SCALE

RSP 19 DATED JANUARY 20, 2017 SUPERSEDES STANDARD PLAN T9 DATED DCTOBER 30, 2015 - PAGE 249 OF THE STANDARD PLANS BOOK DATED 2015. REVISED STANDARD PLAN RSP T9

2015



TO ACCOMPANY PLANS DATED .....





| STATE OF CAL                    | IFORNIA · DEP/                             | ARTMENT OF                         | TRANSPO               | ORTATION                        | l I                                           | Page 1 of                       |
|---------------------------------|--------------------------------------------|------------------------------------|-----------------------|---------------------------------|-----------------------------------------------|---------------------------------|
| STANDAF<br>TR-0100 (REV         | RD ENCRO<br>(. 03/2015)                    | ACHMEN                             | T PER                 |                                 | PPLICATION                                    | FOR CALTRANS USE<br>PERMIT NO.  |
| Please type or This application | <i>print clearly yo</i><br>is not complete | ur answers. C<br>until all require | omplete ,<br>ments ha | <u>ALL</u> fields<br>ve been aj | s, write "N/A" if not applicable.<br>pproved. | DIST/CO/RTE/PM                  |
| Permission is                   | requested to en                            | croach on the                      | State Hi              | ghway rig                       | ht-of-way as follows:                         | SIMPLEX STAMP                   |
| 1. COUNTY                       | · · · · · _                                | <u> </u>                           | 2. ROUTE              | 3. P                            | OSTMILE                                       | 1                               |
| 4. ADDRESS OR                   | STREET NAME                                |                                    |                       | 5. CITY                         |                                               | -                               |
| 6. CROSS STRE                   | ET (Distance and d                         | irection from pro                  | iect site)            | 7. PORTIC                       | ON OF RIGHT-OF-WAY                            | DATE OF SIMPLEX STAMP           |
| 8. WORK TO BE                   | PERFORMED BY                               |                                    | 9. EST                | MATED ST.                       | ART DATE                                      | 10. ESTIMATED COMPLETION DATE   |
| OWN FORC                        | es 📋 contra                                | CTÓR                               |                       |                                 |                                               |                                 |
| 11.<br>EXCAVATION               | MAX. DEPTH                                 | AVG. DEPTH                         | AVG. W                | NDTH                            | LENGTH                                        | SURFACE TYPE                    |
| 12. ESTIMATED                   | COST WITHIN STA                            | TE HIGHWAY R                       | GHT-OF-V              | AY                              | FUNDING SOURCE(S)                             |                                 |
|                                 |                                            |                                    |                       |                                 | FEDERAL S                                     | TATE LOCAL PRIVATE              |
| 13.<br>PIPES                    | PRODUCT TYPE                               |                                    | DIAME                 | TER                             | VOLTAGE / PSIG                                | 14. CALTRANS' PROJECT CODE (ID) |
| 15. Double I<br>Applicant's     | Permit Parent I<br>Reference Numbe         | Permit Number<br>er / Utility Work | Order Nun             | nber                            |                                               |                                 |
| 16. Have your p                 | lans been reviewe                          | d by another Ca                    | iltrans bra           | nch?                            |                                               | ") Who?                         |
| 42 Oceandately                  |                                            |                                    | TATE LUNE             | . فطحام بدمديد                  |                                               | · · · ·                         |

17. Completely describe work to be done within STATE Highway right-of-way:

Attach 6 complete sets of plans (folded to 8.5" x 11") and any applicable specifications, calculations, maps, etc.

| 18 is a City County or other public agency involved in the approval of this project?          | •• • •                    |
|-----------------------------------------------------------------------------------------------|---------------------------|
|                                                                                               |                           |
| YES (If "YES", check type of project AND attach environmental documentation and conditions of | of approval)              |
|                                                                                               |                           |
|                                                                                               |                           |
| NO (If "NO", please check the category below which best describes the project AND answer qu   | lestions A - K on page 2) |
| C DRIVEWAY OR ROAD APPROACH, RECONSTRUCTION, MAINTENANCE OR RESURFACING                       | FENCE                     |
| PUBLIC UTILITY MODIFICATIONS, EXTENSIONS, HOOKUPS                                             | MAILBOX                   |
| FLAGS, SIGNS, BANNERS, DECORATIONS, PARADES AND CELEBRATIONS                                  | EROSION CONTROL           |
|                                                                                               |                           |

ADA NOTICE: For individuals with sensory disabilities, this document is available in alternate formats. For information, call (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

PERMIT NO.

The following questions must be completed when a City, County or other public agency IS NOT involved in the approval of this project.

Your answers to these questions will assist Departmental staff in identifying any physical, biological, social or economic resources that may be affected by your proposed project within State Highway right-of-way and to determine which type of environmental studies may be required to approve your application for an encroachment permit,

It is the applicant's responsibility for the production of all required environmental documentation and supporting studies and in some cases this may be costly and time consuming. If possible, attach photographs of the location of the proposed project. Please answer these questions to the best of your ability. Provide a description of any "YES" answers (type, name, number, etc.)

A. Will any existing vegetation and/or landscaping within State Highway right-of-way be disturbed?

B. Are there waterways (e.g. river, creek, pond, natural pool or dry streambed) edjacent to or within the limits of the project or State Highway right-of-way?

C. Is the proposed project located within five miles of the coast line? D. Will the proposed project generate construction noise levels greater than 86 dBA (e.g. jack-hammering, pile driving)? E. Will the proposed project incorporate land from a public park, recreation area or wildlife refuge open to the public? F. Are there any recreational trails or paths within the limits of the proposed project or State Highway right-of-way? G. Will the proposed project impact any structures, buildings, rail lines or bridges within State Highway right-of-way? H. Will the proposed project impact access to any businesses or residences? I. Will the proposed project impact any existing public utilities or public services? J. Will the proposed project impact existing pedestrian facilities, such as sidewalks, crosswalks or overcrossings? K. Will new lighting be constructed within or adjacent to State Highway right-of-way? 19. Will this project cause a substantial change in the significance of a historical resource (45 years or older), or cultural resource? TYES NO (If "YES", provide a description) 20. Is this project on an existing State Highway or street where the ectivity involves removal of e scenic resource including e significant tree or stand of trees, a rock outcropping or a historic building? YES NO (#"YES", provide a description) 21. is work being done on the applicant's property? YES (If "YES", attach 6 complete sets of site and grading plans.) YES NO 22. Will the proposed project require the disturbance of soil? If "YES", estimate the area within State Highway right-of-way in square feet AND acres: \_\_ (ft²) AND \_ (ecres) estimate the area outside of State Highway right-of-way in square feet AND acres: \_ \_ (ft²) AND (acres) YE\$ NO NO 23. Will the proposed project require dewatering? (gallons) AND \_ If "YES", estimate total gallons AND gallons/month. (gallons/month) SOURCE\*: STORM WATER NON-STORM WATER ("See Caltrans SWMP for definitions of non-storm water discharge: http://www.dot.ca.gov/hq/env/stormwater/index.htm ) 24. How will any storm water or ground water be disposed of from within or near the limits of the proposed project? Storm Drain System Combined Sewer / Storm System Storm Water Retention Besin Other (explain): \_

#### PLEASE READ THE FOLLOWING CLAUSES PRIOR TO SIGNING THIS ENCROACHMENT PERMIT APPLICATION,

The applicant, understands and herein agrees that an encroachment permit can be denied, and/or a bond required for non-payment of prior or present encroachment permit fees. Encroachment Permit fees may still be due when an application is withdrawn or denied, and that a denial may be appealed, in accordance with the California Streets and Highways Code, Section 671.5. All work shall be done in accordance with the California Department of Transportation's (Department) rules and regulations subject to inspection and approval.

The applicant, understands and herein agrees to the general provisions, special provisions and conditions of the encroachment permit, and to indemnify and hold harmless the State, its officers, directors, agents, employees and each of them (indemnitees) from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, judgments, losses and liabilities of every kind and nature whatsoever (Claims) arising out of or in connection with the issuance and/or use of this encroachment permit and the placement and subsequent operation and maintenance of said encroachment for: 1) bodily injury and/or death to persons including but not limited to the Applicant, the State and its officers, directors, agents and employees, the indemnities, and the public; and 2) damage to property of anyone. Except as provided by law, the indemnification provisions stated above shall apply regardless of the existence or degree of fault of indemnities. The Applicant, however, shall not be obligated to indemnify Indemnities for Claims arising from the sole negligence and willful misconduct of State, its officers, directors, agents or employees.

An encroachment permit is not a property right and does not transfer with the property to a new owner.

<u>COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) OF 1990</u>: All work within State Highway right-of-way shall be conducted in compliance with all applicable Federal, State and Local Access laws, regulations and guidelines including but not limited to the Americans with Disabilities Act Accessibility Guidelines (ADAAG), the Public Rights-of-Way Guidelines (PROWG), the Department's current Design Information Bulletin 82, "Pedestrian Accessibility Guidelines for Highway Projects", the Department's Encroachment Permits Manual and encroachment permit.

DISCHARGES OF STORM WATER AND NON-STORM WATER: All work within State Highway right-of-way shall be conducted in compliance with all applicable requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued to the Department, to govern the discharge of storm water and non-storm water from its properties. Work shall also be in compliance with all other applicable Federal, State and Local laws and regulations, and with the Department's Encroachment Permits Manual and encroachment permit. Compliance with the Department's NPDES permit requires amongst other things, the preparation and submission of a Storm Water Pollution Protection Plan (SWPPP), or a Water Pollution Control Program (WPCP), and the approval of same by the appropriate reviewing authority prior to the start of any work. Information on the requirements may also be reviewed on the Department's Construction Website at:

http://www.dot.ca.gov/hg/construc/stormwater

#### 25. NAME OF APPLICANT OR ORGANIZATION

| ADDRESS OF APPLICANT OR ORGANIZATION WHERE PER     | RMIT IS TO BE MAILED (In     | Jude City and Zip C       | ode)      |                | <u> </u>        |
|----------------------------------------------------|------------------------------|---------------------------|-----------|----------------|-----------------|
| E-MAIL ADDRESS                                     |                              | PHONE NUMBER              |           | FAX NUMBER     |                 |
| 26. NAME OF AUTHORIZED AGENT / ENGINEER (A "Letter | of authorization" is require | <br>d if different from # | 25) ISALE | TTER OF AUTHOR | ZATION ATTACHED |
| ADDRESS OF AUTHORIZED AGENT / ENGINEER (Include Ci | ity and Zip Code)            |                           |           |                |                 |
| E-MAIL ADDRESS                                     |                              | PHONE NUMBER              |           | FAX NUMBER     |                 |
| 27. NAME OF BILLING CONTACT (Same as #25 Same      | as #26 🔲 )                   |                           |           |                |                 |
| BILLING ADDRESS WHERE INVOICE(S) IS/ARE TO BE MAIL | ED (Include City and Zip Co  | ode)                      | <u> </u>  |                |                 |
| E-MAIL ADDRESS                                     |                              | PHONE NUMBER              |           | FAX NUMBER     |                 |
| 28. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT     | 29. PRINT OR TYPE NAME       |                           | 30.TITLE  |                | 31. DATE        |

#### APPLICATION FOR ENCROACHMENT PERMIT

#### COUNTY OF TULARE RESOURCE MANAGEMENT AGENCY 5961 S. MOONEY BLVD. VISALIA, CA 93277 (559) 733-6291

ANY REQUIREMENTS OR REGULATIONS YOU FEEL UNJUST MAY BE APPEALED TO THE COUNTY BOARD OF SUPERVISORS. THE CONTRACTOR AND APPLICANT UNDERSTAND THAT THIS IS AN APPLICATION ONLY, NOT A PERMIT. NO WORK SHALL START UNTIL A PERMIT IS ISSUED AND THE PERMIT IS ON THE JOB SITE.

The undersigned hereby applies for a permit to allow them to do certain work within the right-of-way of a County Highway, in accordance with Sections 3-07-1160 to 3-07-1385 of the Ordinance Code of Tulare County. The necessary information concerning said work is as follows:

1. LOCATION and DESCRIPTION of the proposed work to be done within right-of-way.

Α.

| General location describ | bed by number or name of highway. |           |
|--------------------------|-----------------------------------|-----------|
| Road                     | From Avenue                       | To Avenue |
| Avenue                   | From Road                         | To Road   |
| Other                    | From                              | То        |

B. Description of exact location in feet of encroachment from the County property line or section line and edge of pavement, starting from the nearest cross road property line. (If more room is needed attach a sheet).

**Example:** Install 6" steel Water main on Road 100 starting 1510' south of the Center Line of Ave. 100, at 25' east of the center line or section line of Road 100, and 5' east of the edge of oil, then south for 350', then east 5' to private property. INSTALL:

 ATTACH TWO (2) SETS OF PLANS showing road right-of-way, edge of pavement from property line. The exact location of proposed work, all County drain pipes, roads, avenues, type of driveways, bridges (need blowup), footage of encroachment for each road and all existing utilities.

| 3.      | TYPE OF WORK to<br>Sewer            | o be done. (check one)<br>Water       | Elec. Service               | A.C. Driveway       | Pipeline |
|---------|-------------------------------------|---------------------------------------|-----------------------------|---------------------|----------|
|         | TV Cable                            | Other                                 |                             |                     |          |
| 4.      | PURPOSE OF THE<br>New Main          | PROPOSED WORK. (<br>Replacem          | check one)<br>ient 🔽 New Se | ervice   Other      |          |
| 5.<br>\ | Will pavement be cu<br>/es          | t or disturbed.                       | Bore                        | Open Trench         |          |
| 6.      | The materials which<br>Plastic Pipe | will be used to perform<br>Steel Pipe | this work are as follows    | s.<br>Concrete Pipe | Other    |
|         | Size                                | Size                                  | Size                        | Size                | Size     |
|         | SDR Rating                          |                                       |                             |                     |          |
| 7.      | The proposed work w                 | will be commenced on a                | r about                     | _                   |          |
|         | To be completed on                  | or about                              |                             |                     |          |

8. Other pertinent information, including additional information required by the Resource Management Agency (RMA).

IF ADDITIONAL SPACE IS REQUIRED FOR FURNISHING ANY OF THE INFORMATION REQUIRED. PUT THE INFORMATION ON A SEPARATE SHEET OF PAPER AND ATTACH IT TO THIS APPLICATION.

The applicant agrees that the aforementioned work is subject to, and will be performed in accordance with all of the provisions of Sections 3-07-1160 to 3-07-1385 of the Ordinance Code of Tulare County. The applicant agrees to hold the County, its officers, agents and employees harmless from any and all causes of action, penalties, liabilities or loss resulting from claims or court actions arising out of any accidents, loss or damage to persons or property occurring as a result of any work performed pursuant to the permit.

The applicant agrees that the County shall not be responsible for any damage to any structure or installation constructed pursuant to a permit which is not clearly or visibly marked by the construction. reconstruction, maintenance or repair or by use of overweight equipment on the highway. The applicant agrees that he, his successors and assigns, upon being notified of such damage by the Resource

Enclosed

Management Agency Director or designee, shall immediately repair, remove or relocate the damaged structure Or inStallation.

9. As required by sections 3-07-1195 to 3-07-1215 of the Ordinance Code of Tulare County, the following insurance policy and bond are furnished covering said work.

BOND (Min. \$5,000 to Max. \$25,000 determined by R.M.A.) (check one) INSURANCE POLICY (check one) On file with R.M.A. Γ

On file with R.M.A.

Enclosed

#### Bond Amount \$

10. APPROVAL OF SERVING PUBLIC UTILITY, PUBLIC AGENCY, OR COMMUNITY SERVICES DISTRICT FOR UTILITY, SEWER OR WATER CONNECTIONS:

| and of derving ounty                                                                            | Phone number | Signature                                                                     | Date                 |
|-------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------|----------------------|
| CONTRACT                                                                                        | OR           | APPLICANT (PRO                                                                | PERTY OWNER)         |
| Company Name                                                                                    |              | Name                                                                          |                      |
| Address:                                                                                        |              | Address:                                                                      |                      |
| City:                                                                                           | Zip Code:    | City:                                                                         | Zip Code:            |
| Signature:                                                                                      | ·····        | Signature:                                                                    |                      |
| Phone No ()                                                                                     |              | Phone No ()                                                                   |                      |
| Date:                                                                                           |              | Date:                                                                         |                      |
|                                                                                                 | FOR CC       | UNTY USE ONLY                                                                 |                      |
| Application Received                                                                            | FOR CC       | UNTY USE ONLY                                                                 | Bv                   |
| Application Received                                                                            | FOR CC       | OUNTY USE ONLY<br>Field Review                                                | By                   |
| Application Received<br>Insurance expires<br>Bond expires                                       | FOR CC       | OUNTY USE ONLY<br>Field Review<br>Office Check<br>OK for Permit               | Ву<br>Ву<br>Ву       |
| Application Received<br>Insurance expires<br>Bond expires<br>Returned                           | FOR CC       | OUNTY USE ONLY<br>Field Review<br>Office Check<br>OK for Permit<br>correction | Ву<br>Ву<br>Ву       |
| Application Received<br>Insurance expires<br>Bond expires<br>Returned<br>Notes to be added to P | FOR CC       | OUNTY USE ONLY<br>Field Review<br>Office Check<br>OK for Permit<br>correction | By<br>By<br>By<br>By |

## SELF-DEALING TRANSACTION DISCLOSURE FORM

| (1) | Company Board Member Information:                                          |                                  |
|-----|----------------------------------------------------------------------------|----------------------------------|
|     | Name:                                                                      | Date:                            |
|     | Job Title:                                                                 |                                  |
| (2) | Company/Agency Name and Address:                                           |                                  |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
| (3) | Disclosure (Please describe the nature of the self-dealing                 | transaction you are a party to)  |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
| (4) | Explain why this self-dealing transaction is consistent with Code 5233 (a) | the requirements of Corporations |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
|     |                                                                            |                                  |
| (5) | Authorized Signature                                                       |                                  |
|     | Signature:                                                                 | Date:                            |

### SELF-DEALING TRANSACTION DISCLOSURE FORM INSTRUCTIONS

In order to conduct business with the County of Fresno (hereinafter referred to as "County"), members of a contractor's board of directors (hereinafter referred to as "County Contractor"), must disclose any self-dealing transactions that they are a party to while providing goods, performing services, or both for the County. A self-dealing transaction is defined below:

"A self-dealing transaction means a transaction to which the corporation is a party and which one or more of its directors has a material financial interest"

The definition above will be utilized for purposes of completing the disclosure form.

- (1) Enter board member's name, job title (if applicable), and date this disclosure is being made.
- (2) Enter the board member's company/agency name and address.
- (3) Describe in detail the nature of the self-dealing transaction that is being disclosed to the County. At a minimum, include a description of the following:
  - a. The name of the agency/company with which the corporation has the transaction; and
  - b. The nature of the material financial interest in the Corporation's transaction that the board member has.
- (4) Describe in detail why the self-dealing transaction is appropriate based on applicable provisions of the Corporations Codes.
- (5) Form must be signed by the board member that is involved in the self-dealing transaction described in Sections (3) and (4).

# REVISED STANDARD SPECIFICATIONS DATED 09-02-16

### ORGANIZATION

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

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

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

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### DIVISION I GENERAL PROVISIONS 1 GENERAL

## 07-15-16

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

| APCD | air pollution control district  |
|------|---------------------------------|
| AQMD | air quality management district |
| CISS | cast-in-steel shell             |
| CSL  | crosshole sonic logging         |
| GGL  | gamma-gamma logging             |

#### ^^^^

#### 7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

07-15-16 Replace the paragraphs in section 7-1.02I(2) with:

05-06-16

07-15-16

Under 2 CA Code of Regs § 11105:

 During the performance of this contract, the recipient, contractor, and its subcontractors shall not deny the contract's benefits to any person on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination.

- Contractor shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code, § 12900 et seq.), the regulations promulgated thereunder (Cal. Code Regs., tit. 2, § 11000 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Gov. Code, §§ 11135-11139.5), and the regulations or standards adopted by the awarding state agency to implement such article.
- 3. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding state agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, and all other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause.
- 4. Recipient, contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
- 5. The contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

Under 2 CA Code of Regs § 11122:

#### STANDARD CALIFORNIA NONDISCRIMINATION CONSTRUCTION CONTRACT SPECIFICATIONS (GOV. CODE SECTION 12990)

These specifications are applicable to all state contractors and subcontractors having a construction contract or subcontract of \$5,000 or more.

- 1. As used in the specifications:
  - a. "Act" means the Fair Employment and Housing Act.
  - b. "Administrator" means Administrator, Office of Compliance Programs, California Department of Fair Employment and Housing, or any person to whom the Administrator delegates authority;
- 2. Whenever the contractor or any subcontractor subcontracts a portion of the work, it shall include in each subcontract of \$5,000 or more the nondiscrimination clause in this contract directly or through incorporation by reference. Any subcontract for work involving a construction trade shall also include the Standard California Construction Contract Specifications, either directly or through incorporation by reference.
- 3. The contractor shall implement the specific nondiscrimination standards provided in paragraphs 6(a) through (e) of these specifications.
- 4. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer members of any group protected by the Act shall excuse the contractor's obligations under these specifications, Government Code section 12990, or the regulations promulgated pursuant thereto.5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
- 5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
- 6. The contractor shall take specific actions to implement its nondiscrimination program. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor must be able to demonstrate fully its efforts under steps a. through e. below:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and at all facilities at which the contractor's employees are assigned to work. The contractor shall specifically ensure that all foremen, superintendents, and other on-site

supervisory personnel are aware of and carry out the contractor's obligations to maintain such a working environment.

- b. Provide written notification within seven days to the director of the DFEH when the referral process of the union or unions with which the contractor has a collective bargaining agreement has impeded the contractor's efforts to meet its obligations.
- c. Disseminate the contractor's equal employment opportunity policy by providing notice of the policy to unions and training, recruitment and outreach programs and requesting their cooperation in assisting the contractor to meet its obligations; and by posting the company policy on bulletin boards accessible to all employees at each location where construction work is performed.
- d. Ensure all personnel making management and employment decisions regarding hiring, assignment, layoff, termination, conditions of work, training, rates of pay or other employment decisions, including all supervisory personnel, superintendents, general foremen, on-site foremen, etc., are aware of the contractor's equal employment opportunity policy and obligations, and discharge their responsibilities accordingly.
- e. Ensure that seniority practices, job classifications, work assignments, and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the equal employment opportunity policy and the contractor's obligations under these specifications are being carried out.
- 7. Contractors are encouraged to participate in voluntary associations that assist in fulfilling their equal employment opportunity obligations. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on equal employment opportunity in the industry, ensures that the concrete benefits of the program are reflected in the contractor's workforce participation, and can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's.
- 8. The contractor is required to provide equal employment opportunity for all persons. Consequently, the contractor may be in violation of the Fair Employment and Housing Act (Government Code section 12990 et seq.) if a particular group is employed in a substantially disparate manner.
- 9. The contractor shall not use the nondiscrimination standards to discriminate against any person because race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status.
- 10. The contractor shall not enter into any subcontract with any person or firm decertified from state contracts pursuant to Government Code section 12990.
- 11. The contractor shall carry out such sanctions and penalties for violation of these specifications and the nondiscrimination clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Government Code section 12990 and its implementing regulations by the awarding agency. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Government Code section 12990.
- 12. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by OCP and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, status, (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

#### Add to the end of the 2nd sentence in the 1st paragraph of section 7-1.02K(1):

, and hauling and delivery of ready-mixed concrete.

#### Add between the 4th and 5th paragraphs of section 7-1.02K(3):

Submitted certified payrolls for hauling and delivering ready-mixed concrete must be accompanied by a written time record. The time record must include:

- 1. Truck driver's full name and address
- 2. Name and address of the factory or batching plant
- 3. Time the concrete was loaded at the factory or batching plant
- 4. Time the truck returned to the factory or batching plant
- 5. Truck driver's signature certifying under penalty of perjury that the information contained in this written time record is true and correct

#### Add between the 9th and 10th paragraphs of section 7-1.03:

07-15-16

04-22-16

If a height differential of more than 0.04 foot is created by construction activities at a joint transverse to the direction of traffic on the traveled way or a shoulder subject to public traffic, construct a temporary taper at the joint with a slope complying with the requirements shown in the following table:

| Temporary Tapers    |                              |                                |  |  |
|---------------------|------------------------------|--------------------------------|--|--|
| Height differential | Slope (horizontal:vertical)  |                                |  |  |
| (foot)              | Taper use of 14 days or less | Taper use of more than 14 days |  |  |
| Greater than 0.08   | 100:1 or flatter             | 200:1 or flatter               |  |  |
| 0.04–0.08           | 70:1 or flatter              | 70:1 or flatter                |  |  |

For a taper on existing asphalt concrete or concrete pavement, construct the taper with minor HMA under section 39-2.07.

Grind existing surfaces to accommodate a minimum taper thickness of 0.10 foot under either of the following conditions:

- 1. HMA material such as rubberized HMA, polymer-modified bonded wearing course, or open-graded friction course is unsuitable for raking to a maximum 0.02 foot thickness at the edge
- 2. Taper will be in place for more than 14 days

For a taper on a bridge deck or approach slab, construct the taper with polyester concrete under section 60-3.04B.

The completed surface of the taper must be uniform and must not vary more than 0.02 foot from the lower edge of a 12-foot straightedge when placed on its surface parallel and perpendicular to traffic.

If authorized, you may use alternative materials or methods to construct the required taper.

#### Replace § 337.15 in the 3rd item in the list in the paragraph of section 7-1.06B with:

05-06-16

02-12-16

§ 337.1

#### Add between the 1st and 2nd paragraphs of section 7-1.11A:

Comply with 46 CFR 381.7(a)–(b).

^^^^

#### 8 PROSECUTION AND PROGRESS

#### 07-15-16

#### Replace the table in the 3rd paragraph of section 8-1.10A with:

| Tota          | l bid         | Liquidated damages |  |  |
|---------------|---------------|--------------------|--|--|
| From over     | From over To  |                    |  |  |
| \$0           | \$60,000      | \$1,400            |  |  |
| \$60,000      | \$200,000     | \$2,900            |  |  |
| \$200,000     | \$500,000     | \$3,200            |  |  |
| \$500,000     | \$1,000,000   | \$3,500            |  |  |
| \$1,000,000   | \$2,000,000   | \$4,000            |  |  |
| \$2,000,000   | \$5,000,000   | \$4,800            |  |  |
| \$5,000,000   | \$10,000,000  | \$6,800            |  |  |
| \$10,000,000  | \$20,000,000  | \$10,000           |  |  |
| \$20,000,000  | \$50,000,000  | \$13,500           |  |  |
| \$50,000,000  | \$100,000,000 | \$19,200           |  |  |
| \$100,000,000 | \$250,000,000 | \$25,300           |  |  |

#### Liquidated Damages

07-15-16

^^^^

#### 9 PAYMENT

#### 01-15-16

Replace may withhold in the 1st paragraph of section 9-1.16E(4) with:

withholds

01-15-16

04-15-16

#### ^^^^

### DIVISION II GENERAL CONSTRUCTION 10 GENERAL

#### 04-15-16 Replace section 10-1.02B with:

#### 10-1.02B Traffic Elements

Before starting the operational test of a traffic management system that directly impacts traffic, the system must be ready for operation, and all signs, pavement delineation, and pavement markings must be in place at the system's location.

If maintaining existing traffic management system elements during construction is shown on the Bid Item List, a list of the systems shown within the project limits and their operational status is included in the *Information Handout*. Before starting job site activities, conduct a preconstruction operational status check of the existing system's elements and each element's communication status with the transportation management center to which it communicates. If an existing system element is discovered and has not been identified, the Department adds the element to the list of systems. The pre- and postconstruction operational status check of the discovered elements is change order work.

If maintaining existing traffic management system elements during construction is not shown on the Bid Item List and an existing system element is discovered during the work, notify the Engineer. The Engineer orders a pre- and postconstruction operational status check of the discovered elements. The status check of the discovered elements is change order work.

Conduct the status check with the Engineer and an electrical representative from the traffic operations office of the district in which the work is located. The Department provides you a list of the preconstruction operational status-check results, including:

- 1. Existing traffic management system elements and their locations within the project limits
- 2. Fully functioning elements
- 3. Nonoperational elements

Before Contract acceptance, conduct a postconstruction operational status check of all elements shown on the list with the Engineer and an electrical representative from the traffic operations office of the district in which the work is located.

Replace 10-3 of section 10 with:

04-15-16

04-15-16

10-2-10-3 RESERVED

^^^^

#### **12 TEMPORARY TRAFFIC CONTROL**

07-15-16 Replace section 12-3.32 with:

#### 12-3.32 PORTABLE CHANGEABLE MESSAGE SIGNS

12-3.32A General

#### 12-3.32A(1) Summary

Section 12-3.32A includes specifications for placing portable changeable message signs.

#### 12-3.32A(2) Definitions

Reserved

#### 12-3.32A(3) Submittals

If requested, submit a certificate of compliance for each PCMS.

Submit your cell phone number before starting the first activity that requires a PCMS.

#### 12-3.32A(4) Quality Assurance

Reserved

#### 12-3.32B Materials

Each PCMS must have a message board, controller unit, power supply, and a structural support system. The unit must be assembled to form a complete self-contained PCMS that can be delivered to the job site and placed into immediate operation. The sign unit must be capable of operating at an ambient air temperature from -4 to 158 degrees F and must be unaffected by mobile radio transmissions other than those required to control the PCMS.

A PCMS must be permanently mounted on a trailer, truck bed, or truck cab under the manufacturer's instructions. The PCMS must be securely mounted on the support vehicle such that it remains attached during any impact to the vehicle. If it is mounted on a trailer, the trailer must be capable of being leveled and plumbed.

A minimum of 3 feet of retroreflective material must be permanently affixed on all 4 sides of the trailer. The retroreflective material need not be continuous but must be visible on the same plane.

The sign panel must be capable of displaying a 3-line message with at least 7 characters per line. The characters must be at least 18 inches in height where the useable shoulder area is at least 15 feet wide.

To prevent encroachment onto the traveled way where the useable shoulder area is less than 15 feet wide, you may use a smaller message panel with at least 12-inch-high characters.

The message displayed on the sign must be visible from a distance of 1,500 feet and legible from a distance of 750 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20.

The characters on a sign panel may be 10 inches in height if:

- 1. PCMS is mounted on a service patrol truck or other incident response vehicle or used for traffic control operations on a highway facility where the posted speed limit is less than 40 mph
- 2. Message is legible from a distance of at least 650 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20

A matrix sign must provide a complete alphanumeric selection.

A PCMS must automatically adjust its brightness under varying light conditions to maintain the legibility of the message. The sign must be equipped with an automatic-dimming mode that automatically compensates for the influence of temporary light sources or abnormal lighting conditions. The sign must have 3 or more manual dimming modes of different intensities.

During the hours of darkness, a matrix sign not using lamps must be either internally or externally illuminated.

The controller must be an all solid-state unit containing the necessary circuitry for the storage of at least 5 preprogrammed messages. The controller must be installed at a location that allows the operator to perform all functions from a single position. The controller must have a keyboard entry system that allows the operator to generate an infinite number of additional messages in addition to the preprogrammed stored messages. The keyboard must be equipped with a security lockout feature to prevent unauthorized use of the controller.

The controller must have:

- 1. Nonvolatile memory that stores keyboard-created messages during periods when the power is not activated
- 2. Variable display rate that allows the operator to match the information display to the speed of approaching traffic
- 3. Screen upon which messages may be reviewed before being displayed on the sign

The flashing-off time must be adjustable from within the control cabinet.

#### 12-3.32C Construction

Place a PCMS as far from the traveled way as practicable where it is legible to approaching traffic without encroaching on the traveled way. Where the vertical roadway curvature restricts the sight distance of approaching traffic, place the sign on or before the crest of the curvature where it is most visible to the approaching traffic. Where the horizontal roadway curvature restricts the sight distance of approaching traffic, place the sign at or before the curve where it is most visible to approaching traffic. Where the curve where it is most visible to approaching traffic, place the sign at or before the curve where it is most visible to approaching traffic. Where practicable, place the sign behind guardrail or Type K temporary railing.

Make a taper consisting of 9 traffic cones placed 25 feet apart to delineate the location of a PCMS except where the sign is placed behind guardrail or Type K temporary railing.

When in full operation, the bottom of a sign must be at least 7 feet above the roadway in areas where pedestrians are anticipated and 5 feet above the roadway elsewhere, and the top of the sign must be not more than 14.5 feet above the roadway.

Operate the PCMS under the manufacturer's instructions.

Keep the PCMS clean to provide maximum visibility.

If multiple signs are needed, place each sign on the same side of the road at least 1,000 feet apart on freeways and expressways and at least 500 feet apart on other types of highways.

If more than one PCMS is simultaneously visible to traffic, only 1 sign may display a sequential message at any time. Do not use dynamic message displays, such as animation, rapid flashing, dissolving, exploding, scrolling, horizontal movement, or vertical movement of messages. The message must be centered within each line of the display.

You may use an additional PCMS if more than 2 phases are needed to display a message.

Display only messages shown or ordered.

Repeat the entire message continuously in not more than 2 phases of at least 3 seconds per phase. The sum of the display times for both of the phases must be a maximum of 8 seconds. If more than 2 phases are needed to display a message, use an additional PCMS.

You must be available by cell phone during activities that require a sign. Be prepared to immediately change the displayed message if ordered. You may operate the sign with a 24-hour timer control or remote control if authorized.

After the initial placement, move a sign from location to location as ordered.

When a PCMS is not in use, move it to an area at least 15 feet from the edge of the traveled way or remove it from the job site away from traffic.

#### 12-3.32D Payment

Not Used

#### Add between the 1st sentence and 2nd sentences in the 1st paragraph of section 12-4.02A(3)(a):

For a project in District 7, submit the request at least 15 days before the proposed closure date.

#### Replace section 12-4.02C(2) with:

12-4.02C(2) Lane Closure System

#### 12-4.02C(2)(a) General

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st closure request. The Department provides the training within 15 days after your request.

LCS training is web-based or held at a time and location agreed upon by you and the Engineer. For webbased training, the Engineer provides you the website address to access the training.

With 5 business days after completion of the training, the Department provides LCS accounts and user IDs to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

| The project is not accessible in LCS after Contract acceptance.                                                                         | 04-15-16 |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>12-4.02C(2)(b)</b> Status Updates for Authorized Closures<br>Update the status of authorized closures using the LCS Mobile web page. | 01-15-16 |
| For a stationary closure, use code:                                                                                                     |          |

- 1. 10-97 immediately before you place the 1st advance warning sign
- 2. 10-98 immediately after you remove all of the advance warning signs

For a moving closure, use code:

- 1. 10-97 immediately before the actual start time of the closure
- 2. 10-98 immediately after the actual end time of the closure

01-15-16

Cancel an authorized closure by using code 10-22 within 2 hours after the authorized start time.

If you are unable to access the LCS Mobile web page, immediately notify the Engineer of the closure's status.

#### Replace the 1st sentence in the 3rd paragraph of section 12-6.03A with:

<sup>07-15-16</sup> When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the temporary pavement delineation, including any underlying adhesive for temporary pavement markers, from the final layer of surfacing and from the pavement to remain in place.

#### ^^^^

#### **13 WATER POLLUTION CONTROL**

09-02-16

## Replace *General Industrial Permit* in the 2nd item in the list in the paragraph of section 13-1.01C(3) with:

Industrial General Permit

#### Replace the 2nd paragraph of section 13-1.01D(2) with:

<sup>05-06-16</sup> Discharges from manufacturing facilities, such as batch plants and crushing plants, must comply with the discharge requirements in the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities; Order No. 2014-0057-DWQ, CAS000001 (Industrial General Permit), issued by the

SWRCB. For the Industrial General Permit, go to the SWRCB website.

#### Replace General Industrial Permit in the 3rd paragraph of section 13-1.01D(2) with:

Industrial General Permit

#### Replace the 2nd paragraph of section 13-3.01D(2) with:

09-02-16

05-06-16

For a project in the Lake Tahoe Hydrologic Unit, discharges of stormwater from the project must comply with the NPDES General Permit for General Waste Discharge Requirements and National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity in the Lake Tahoe Hydrologic Unit, Counties of Alpine, El Dorado, and Placer, (Order No. R6T-2016-0010 and NPDES No. CAG616002). You may view the General Permit for the Lake Tahoe Hydrologic Unit at the Construction Storm Water Program page of the SWRCB website.

#### Replace the 2nd paragraph of section 13-8.01D(2) with:

09-02-16

For a project within the Lake Tahoe Hydrologic Unit, the design, installation, operation, and monitoring of the temporary ATS and monitoring of the treated effluent must comply with Attachment E of the NPDES General Permit for General Waste Discharge Requirements and National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity in the Lake Tahoe Hydrologic Unit, Counties of Alpine, El Dorado, and Placer, (Order No. R6T-2016-0010 and NPDES No. CAG616002). You may view the General Permit for the Lake Tahoe Hydrologic Unit at the Construction Storm Water Program page of the SWRCB website.

05-06-16

^^^^

#### **16 TEMPORARY FACILITIES**

#### 04-15-16

#### Add between the 1st and 2nd sentences of section 16-2.03A(1):

Constructing a high-visibility fence includes the installation of any signs specified in the special provisions.

^^^^^

### DIVISION III EARTHWORK AND LANDSCAPE **20 LANDSCAPE**

07-15-16

Replace 86 in the 1st paragraph of section 20-2.01C(2) with:

87

#### Replace the 8th paragraph of section 20-2.01C(2) with:

Trenches for irrigation supply lines and conduits 3 inches and larger in diameter must be a minimum of 18 inches below the finished grade, measured to the top of the installed pipe.

#### Replace 86 in the 1st paragraph of section 20-2.01C(3) with:

87

87

#### Replace section 20-2.04A(4) with:

Perform conductors test. The test must comply with the specifications in section 87.

Where the conductors are installed by trenching and backfilling, perform the test after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

#### Replace the 1st paragraph of section 20-2.04C(4) with:

Splice low voltage control and neutral conductors under section 87, except do not use Method B.

#### Replace the 3rd paragraph of section 20-2.05B with:

The impeller must be glass reinforced nylon on a tungsten carbide shaft.

#### Replace 86 in the 2nd paragraph of section 20-2.06C with:

04-15-16

04-15-16

04-15-16

07-15-16

04-15-16

04-15-16

04-15-16

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#### Replace section 20-2.07B(5) with:

#### 20-2.07B(5) PVC Pipe Conduit Sleeve

PVC pipe conduit sleeves must be schedule 40 complying with ASTM D1785.

Fittings must be schedule 80.

#### Replace section 20-2.07C(3) with:

#### 20-2.07C(3) PVC Pipe Conduit Sleeve

Where PVC pipe conduit sleeves 2 inches or less in outside diameter is installed under surfacing, you may install by directional boring under section 20-2.07C(2)(b).

For sleeves 2 inches or less in diameter, the top of the conduit must be a minimum of 18 inches below surfacing.

Extend sleeves 6 inches beyond surfacing. Cap ends of conduit until used.

#### Replace sections 20-2.09B and 20-2.09C with:

07-15-16

#### 20-2.09B Materials

#### 20-2.09B(1) General

Swing joints must match the inlet connection size of the riser.

Where shown, a sprinkler assembly must include a check valve.

Threaded nipples for swing joints and risers must be schedule 80, PVC 1120 or PVC 1220 pipe, and comply with ASTM D1785. Risers for sprinkler assemblies must be UV resistant.

Fittings for sprinkler assemblies must be injection-molded PVC, schedule 40, and comply with ASTM D2466.

Flexible hose for sprinkler assemblies must be leak-free, non-rigid and comply with ASTM D2287, cell Type 6564500. The hose must comply with ASTM D2122 and have the thickness shown in the following table:

| Nominal hose diameter | Minimum wall thickness |
|-----------------------|------------------------|
| (inch)                | (inch)                 |
| 1/2                   | 0.127                  |
| 3/4                   | 0.154                  |
| 1                     | 0.179                  |

Solvent cement and fittings for flexible hose must comply with section 20-2.08B(5).

#### 20-2.09B(2) Pop-Up Sprinkler Assemblies

Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure reducing device, fittings, and sprinkler protector where shown.

#### 20-2.09B(3) Riser Sprinkler Assemblies

Each riser sprinkler assembly must include a body, flexible hose, threaded nipple, nozzle, swing joint (except for a Type V riser), pressure reducing device, fittings, and riser support where shown.

#### 20-2.09B(4) Tree Well Sprinkler Assemblies

Each tree well sprinkler assembly must include a threaded nipple, nozzle, swing joint, fittings, perforated drainpipe, and drain grate.

04-15-16

The perforated drainpipe must be commercial-grade, rigid PVC pipe with holes spaced not more than 6 inches on center on 1 side of the pipe.

The drain grate must be a commercially-available, 1-piece, injection-molded grate manufactured from structural foam polyolefins with UV light inhibitors. Drain grate must be black.

Gravel for filling the drainpipe must be graded such that 100 percent passes the 3/4-inch sieve and 100 percent is retained on the 1/2-inch sieve. The gravel must be clean, washed, dry, and free from clay or organic material.

#### 20-2.09C Construction

Where shown, install a flow shut-off device under the manufacturer's instructions, unless you use equipment with a preinstalled flow shut-off device.

Where shown, install a pressure reducing device under the manufacturer's instructions, unless you use equipment with a preinstalled pressure reducing device.

Install pop-up and riser sprinkler assembly:

- 1. From 6-1/2 to 8 feet from curbs, dikes, and sidewalks
- 2. At least 10 feet from paved shoulders
- 3. At least 3 feet from fences and walls

If sprinkler assembly cannot be installed within these limits, the location will be determined by the Engineer.

Set sprinkler assembly riser on slopes perpendicular to the plane of the slope.

#### Replace the paragraph of section 20-2.10B(3) with:

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07-15-16

07-15-16

Each check valve must be one of the following:

- 1. Schedule 80 PVC with a factory setting to withstand a minimum 7-foot head on risers
- 2. Class 200 PVC if used on a nonpressurized plastic irrigation supply line
- 3. Internal to the sprinkler body with a factory setting to withstand a minimum 7-foot head

#### Replace the paragraph of section 20-2.10C(3) with:

Install check valves as necessary to prevent low-head drainage.

#### Replace the paragraphs of section 20-3.01B(10) with:

Each plant stake for vines must be nominal 1 by 1 inch and 18 inches long.

Each plant stake for trees must be nominal 2 by 2 inches or nominal 2 inches in diameter and long enough to keep the tree in an upright position.

#### Replace the paragraph of section 20-3.01B(11) with:

Each plant tie for vines must be extruded vinyl-based tape, 1 inch wide and at least 8 mils thick.

Each plant tie for trees must be a (1) minimum 3/4-inch-wide, UV-resistant, flexible vinyl tie complying with ASTM D412 for tensile and elongation strength, or (2) lock-stitch, woven polypropylene with a minimum 900 lb tensile strength.

#### Add between the 7th and 8th paragraphs of section 20-3.02C(3)(b):

Spread the vine shoots and tie them with a plant tie to each stake above the crossing point.

#### Replace the 8th paragraph of section 20-3.02C(3)(b) with:

07-15-16

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07-15-16

Tie trees to the stakes with 2 tree ties, 1 tie to each stake. Each tie must form a figure eight by crossing the tie between the tree and the stake. Install ties at the lowest position that will support the tree in an upright position. Install the ties such that they provide trunk flexibility but do not allow the trunk to rub against the stakes. Wrap each end of the tie 1-1/2 turns around the stake and securely tie or nail it to the stake.

#### Replace the 1st paragraph of section 20-5.02C(1) with:

Where edging is used to delineate the limits of inert ground cover or wood mulch areas, install the edging before installing the inert ground cover or wood mulch.

| Delete AND MULCHES in the heading of section 20-5.03.                                                                                  | 07-15-16 |
|----------------------------------------------------------------------------------------------------------------------------------------|----------|
| Delete and mulches in the paragraph of section 20-5.03A(1)(a).                                                                         | 07-15-16 |
| Replace the paragraph of section 20-5.03A(3)(a) with:                                                                                  |          |
| Before installing inert ground cover, remove plants and weeds to the ground level.                                                     | 07-15-16 |
| Delete or mulch at each occurrence in sections 20-5.03A(3)(c) and 20-5.03A(3)(d).                                                      | 07-15-16 |
| Replace section 20-5.03E with:                                                                                                         |          |
| 20-5.03E Reserved                                                                                                                      | 07-15-16 |
| Replace section 20-5.04 with:                                                                                                          |          |
| 20-5.04 WOOD MULCH<br>20-5.04A General<br>20-5.04A(1) Summary<br>Section 20-5.04 includes specifications for placing wood mulch.       | 07-15-16 |
| 20-5.04A(2) Definitions<br>Reserved                                                                                                    |          |
| <b>20-5.04A(3) Submittals</b><br>Submit a certificate of compliance for wood mulch.                                                    |          |
| Submit a 2 cu ft mulch sample with the mulch source shown on the bag. Obtain authorization befor delivering the mulch to the job site. | e        |

20-5.04A(4) Quality Assurance

Reserved

#### 20-5.04B Materials

#### 20-5.04B(1) General

Mulch must not contain more than 0.1 percent of deleterious materials such as rocks, glass, plastics, metals, clods, weeds, weed seeds, coarse objects, sticks larger than the specified particle size, salts, paint, petroleum products, pesticides or chemical residues harmful to plant or animal life.

#### 20-5.04B(2) Tree Bark Mulch

Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.

The mulch must be ground such that at least 95 percent of the material by volume is less than 2 inches long in any dimension and no more than 30 percent by volume is less than 1 inch long in any dimension.

#### 20-5.04B(3) Wood Chip Mulch

Wood chip mulch must:

- 1. Be derived from clean wood
- 2. Not contain leaves or small twigs
- 3. Contain at least 95 percent by volume of wood chips with a width and thickness from 1/16 to 3/8 inch and a length from 1/2 to 3 inches

#### 20-5.04B(4) Shredded Bark Mulch

Shredded bark mulch must:

- 1. Be derived from trees
- 2. Be a blend of loose, long, thin wood, or bark pieces
- 3. Contain at least 95 percent by volume of wood strands with a width and thickness from 1/8 to 1-1/2 inches and a length from 2 to 8 inches

#### 20-5.04B(5) Tree Trimming Mulch

Tree trimming mulch must:

- 1. Be derived from chipped trees and may contain leaves and small twigs
- 2. Contain at least 95 percent by volume of material less than 3 inches long for any dimension and not more than 30 percent by volume of material less than 1 inch long for any dimension

#### 20-5.04B(6)-20-5.04B(11) Reserved

#### 20-5.04C Construction

Before placing wood mulch, remove plants and weeds to the ground level.

Maintain the planned flow lines, slope gradients, and contours of the job site. Grade the subgrade to a smooth and uniform surface.

Place mulch after the plants have been planted.

Place mulch in the plant basin at the rate described. Mulch must not come in contact with the plant crown and stem.

Place mulch as shown in areas outside of plant basins to a uniform thickness.

Spread mulch from the outside edge of the plant basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the plant is 12 feet or more from the adjacent edges of any of these elements, spread the mulch 6 feet beyond the outside edge of the plant basin.

Do not place mulch within 4 feet of:

- 1. Flow line of earthen drainage ditches
- 2. Edge of paved ditches
- 3. Drainage flow lines

#### 20-5.04D Payment

The payment quantity for wood mulch is the volume measured in the vehicle at the point of delivery.

^^^^

#### 21 EROSION CONTROL

07-15-16

Add between *tube* and *12* in the 1st paragraph of section 21-2.02Q:

8 or

07-15-16

^^^^

### **DIVISION IV SUBASES AND BASES**

#### 23 GENERAL

07-15-16

Replace the headings and paragraphs in section 23 with:

#### 23-1 GENERAL

07-15-16

#### 23-1.01 GENERAL

#### 23-1.01A Summary

Section 23 includes general specifications for constructing subbases and bases.

#### 23-1.01B Definitions

Reserved

#### 23-1.01C Submittals

Submit a QC plan for the types of subbases or bases where described.

#### 23-1.01D Quality Assurance

23-1.01D(1) General

#### 23-1.01D(1)(a) General

Take samples under California Test 125.

#### 23-1.01D(1)(b) Test Result Disputes

You and the Engineer must work together to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 business days of receiving the test result if you dispute the test result.

If you or the Engineer dispute each other's test results, submit your test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the independent third party participates in a dispute resolution, it must be qualified under AASHTO Materials Reference Laboratory program and the Department's Independent Assurance Program. The independent third party must have no prior direct involvement with this Contract. By mutual agreement, the independent third party is chosen from:

1. Department laboratory in a district or region not in the district or region the project is located

- 2. Transportation Laboratory
- 3. Laboratory not currently employed by you or your material producer

If split acceptance samples are not available, the independent third party uses any available material representing the disputed material for evaluation.

If the independent third party determines the Department's test results are valid, the Engineer deducts the independent third party testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party testing costs.

#### 23-1.01D(2) Quality Control

#### 23-1.01D(2)(a) General

Provide a QC manager when the quantity of subbase or base is as shown in the following table:

| Subbase or base                          | Requirement |  |  |  |
|------------------------------------------|-------------|--|--|--|
| Stabilized soil (sq yd)                  | ≥ 20,000    |  |  |  |
| Aggregate subbases (cu yd)               | ≥ 20,000    |  |  |  |
| Aggregate bases (cu yd)                  | ≥ 20,000    |  |  |  |
| CTB (cu yd)                              | ≥ 10,000    |  |  |  |
| Lean concrete base (cu yd)               | ≥ 2,000     |  |  |  |
| Rapid strength concrete base (cu yd)     | ≥ 1,000     |  |  |  |
| Lean concrete base rapid setting (cu yd) | ≥ 1,000     |  |  |  |
| Concrete base (cu yd)                    | ≥ 1,000     |  |  |  |
| Treated permeable bases (cu yd)          | ≥ 2,000     |  |  |  |
| Reclaimed pavements (sq yd)              | ≥ 10,000    |  |  |  |

#### **QC Manager Requirements**

Provide a testing laboratory to perform quality control tests. Maintain sampling and testing equipment in proper working condition.

You are not entitled to compensation for the suspension of work resulting from noncompliance with quality control requirements, including those identified within the QC plan.

#### 23-1.01D(2)(b) Quality Control Plan

The QC plan must describe the organization and procedures used to:

- 1. Control the production process
- 2. Determine if a change to the production process is needed
- 3. Implement a change

The QC plan must include action and suspension limits and details of corrective action to be taken if any process is outside of those limits. Suspension limits must not exceed specified acceptance criteria.

The QC plan must describe how test results will be submitted including times for sampling and testing for each quality characteristic.

#### 23-1.01D(2)(c) Qualifications

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

Personnel performing sampling and testing must be qualified under the Department's Independent Assurance Program for the sampling and testing performed.

#### 23-1.01D(3) Department Acceptance

Reserved

23-1.02 MATERIALS

Not Used

23-1.03 CONSTRUCTION Not Used

23-1.04 PAYMENT Not Used

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#### 23-2-23-7 RESERVED

^^^^

#### 24 STABILIZED SOILS

07-15-16 Add to section 24-1.01C(1):

Submit a stabilized soil quality control plan.

#### Add to section 24-1.01D(1):

Construct test pads for compaction tests by scraping away material to the depth ordered. If a compaction test fails, corrective action must include the layers of material already placed above the test pad elevation.

#### Replace section 24-1.01D(2) with:

24-1.01D(2) Quality Control 24-1.01D(2)(a) General Reserved

24-1.01D(2)(b) Quality Control Plan

Reserved

24-1.01D(2)(c) Qualifications

Reserved

#### 24-1.01D(2)(d) Preparing Basement Material

After preparing an area for soil stabilization, verify the surface grades.

#### 24-1.01D(2)(e) Mixing

Except for clods larger than 1 inch, randomly test the adequacy of the mixing with a phenolphthalein pH indicator solution.

#### Replace the 1st paragraph of section 24-1.03C with:

The Engineer orders the application rate as pounds of stabilizing agent per square yard of basement material to be stabilized.

07-15-16

07-15-16

#### Replace 250 in the 2nd sentence in the 2nd paragraph of section 24-2.01D(2)(c) with:

Delete section 24-2.01D(1)(c)

500

07-15-16

07-15-16

07-15-16

#### 24-2.01D(2)(d) Quality Control Testing

Lime stabilized soil quality control must include testing the quality characteristics at the frequencies shown in the following table:

| QC Testing Frequencies                                                                                            |                             |                              |                                                                                                            |  |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|------------------------------------------------------------------------------------------------------------|--|
| Quality characteristic                                                                                            | Test method                 | Sampling location            | Minimum frequency                                                                                          |  |
| Ground surface temperature<br>before adding lime and full depth<br>ground temperature during<br>mixing operations |                             | Each temperature<br>location | 1 test per 20,000 sq ft,<br>minimum 1 per day                                                              |  |
| Lime application rate                                                                                             | Calibrated<br>tray or equal | Roadway                      | 1 test per 40,000 sq ft,<br>minimum 2 per day                                                              |  |
| Gradation on mixed material                                                                                       | California<br>Test 202      | Roadway                      | 1 per 500 cu yd,<br>minimum 1 per day                                                                      |  |
| Moisture content                                                                                                  | California<br>Test 226      | Roadway                      | 1 per 500 cu yd on each<br>layer, each day during<br>mixing and mellowing<br>periods, minimum 1 per<br>day |  |
| Relative compaction                                                                                               | California<br>Test 231      | Roadway                      | 1 per 500 cu yd on each<br>layer, minimum 1 per<br>day                                                     |  |

^^^^

#### **25 AGGREGATE SUBBASES**

07-15-16 Replace Reserved in section 25-1.01C with:

Submit an aggregate subbase QC plan.

#### Replace Reserved in section 25-1.01D(2) with:

25-1.01D(2)(a) General

Reserved

25-1.01D(2)(b) Quality Control Plan Reserved

25-1.01D(2)(c) Qualifications

Reserved

#### 25-1.01D(2)(d) Quality Control Testing

AS quality control must include testing the quality characteristics at the frequencies shown in the following table:

07-15-16

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|                                                               |                                           | windrows, or                                      |                                                |
|---------------------------------------------------------------|-------------------------------------------|---------------------------------------------------|------------------------------------------------|
|                                                               |                                           | roadways                                          | 1 per 500 cu yd but at least one per           |
| Sand equivalent                                               | California Test                           | Stockpiles,                                       | day of placement                               |
|                                                               | 217                                       | transportation units,                             |                                                |
|                                                               |                                           | windrows, or                                      |                                                |
|                                                               |                                           | roadways                                          |                                                |
| Relative                                                      | California Test                           | Roadway                                           | 1 per 500 sq yd on each layer                  |
| compaction                                                    | 231                                       |                                                   |                                                |
| <sup>a</sup> Additional R-value fr<br>equivalent tests is 4 o | equency testing wi<br>or more above the s | Ill not be required when specified operating rang | the average of 4 consecutive sand<br>le value. |
| Add                                                           | between the 2nd                           | and 3rd paragraphs of                             | section 25-1.01D(3):                           |
|                                                               |                                           |                                                   | 07-15                                          |
| he Engineer takes ag                                          | gregate subbase s                         | amples for R-value, agg                           | regate gradation, and sand equivalent          |

**QC Testing Frequencies** 

Sampling location

Stockpiles,

transportation units.

windrows, or roadways

Stockpiles,

transportation units,

The Er ent from any of the following locations:

1. Windrow

Quality

characteristic

**R**-value

Aggregate

gradation

Test method

California Test

301

California Test

202

2. Roadway

07-15-16 Delete for each noncompliant test result in the 4th paragraph of section 25-1.01D(3).

07-15-16

Delete a in the 5th paragraph of section 25-1.01D(3).

^^^^

#### **26 AGGREGATE BASES**

07-15-16

Replace Reserved in section 26-1.01C with:

Submit an aggregate base QC plan.

#### Replace Reserved in section 26-1.01D(1) with:

07-15-16 Aggregate samples must not be treated with lime, cement, or chemicals before testing for durability index. Aggregate from untreated reclaimed processed AC, PCC, LCB, or CTB is not considered treated.

07-15-16

#### 7-15-16

Minimum frequency

1 test before beginning work and

every 2000 cu yd thereafter<sup>a</sup>

#### 26-1.01D(2)(a) General

Reserved

#### 26-1.01D(2)(b) Quality Control Plan

Reserved

#### 26-1.01D(2)(c) Qualifications

Reserved

#### 26-1.01D(2)(d) Quality Control Testing

AB quality control must include testing the quality characteristics at the frequencies shown in the following table:

| QC Testing Frequencies        |                     |                       |                                           |  |
|-------------------------------|---------------------|-----------------------|-------------------------------------------|--|
| Quality characteristic        | Test method         | Sampling location     | Minimum frequency                         |  |
| R-value                       | California Test 301 | Stockpiles,           | 1 test before starting work and           |  |
|                               |                     | transportation units, | every 2,000 cu yd thereafter <sup>a</sup> |  |
|                               |                     | windrows, or          |                                           |  |
|                               |                     | roadways              |                                           |  |
| Aggregate gradation           | California Test 202 | Stockpiles,           | 1 per 500 cu yd but at least              |  |
|                               |                     | transportation units, | one per day of placement                  |  |
|                               |                     | windrows, or          |                                           |  |
|                               |                     | roadways              |                                           |  |
| Sand equivalent               | California Test 217 | Stockpiles,           |                                           |  |
|                               |                     | transportation units, |                                           |  |
|                               |                     | windrows, or          |                                           |  |
|                               |                     | roadways              |                                           |  |
| Durability index <sup>D</sup> | California Test 229 | Stockpiles,           | 1 per project                             |  |
|                               |                     | transportation units, |                                           |  |
|                               |                     | windrows, or          |                                           |  |
|                               |                     | roadways              |                                           |  |
| Relative compaction           | California Test 231 | Roadway               | 1 per 500 sq yd on each layer             |  |

<sup>a</sup>Additional R-value frequency testing will not be required when the average of 4 consecutive sand equivalent tests is 29 or greater for Class 2 AB or 25 or greater for Class 3 AB.

<sup>b</sup>Applies if section 26-1.02 contains an applicable requirement for durability index

#### Add between requirements, and and in the 1st paragraph of section 26-1.01D(3):

durability,

#### Add between the 2nd and 3rd paragraphs of section 26-1.01D(3):

The Engineer takes aggregate base samples for R-value, aggregate gradation, sand equivalent, and durability index from any of the following locations:

- 1. Windrow
- 2. Roadway

#### Delete the 3rd paragraph of section 26-1.01D(3).

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#### **27 CEMENT TREATED BASES**

07-15-16 Add to section 27-1.01C:

Submit cement treated base QC plan.

#### Replace the headings and paragraphs in section 27-1.01D with:

27-1.01D Quality Assurance

#### 27-1.01D(1) General

After the CTB has been spread on the subgrade and before initial compaction, the cement content of the completed mixture of CTB must not vary from the specified cement content by more than 0.6 percent of the weight of the dry aggregate when tested under California Test 338.

For Class A CTB, compaction is tested under California Test 312 or 231.

The relative compaction of CTB must be at least 95 percent. Each layer of CTB may be tested for compaction, or all layers may be tested together at the option the Engineer. If all layers are tested together, you are not relieved of the responsibility to achieve the required compaction in each layer placed.

#### 27-1.01D(1)(a) Aggregate

When tested under California Test 301, aggregate for Class B CTB must have (1) an R-value of at least 60 before mixing with cement and (2) an R-value of at least 80 when aggregate is mixed with an amount of cement that does not exceed 2.5 percent by weight of the dry aggregate.

Before sand equivalent testing, aggregate samples must not be treated with lime, cement, or chemicals.

If the aggregate gradation test results, the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing CTB for the remainder of the work day. Do not place additional CTB until you demonstrate to the Engineer that the CTB to be placed complies with the operating range requirements.

If the aggregate gradation test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the CTB or request a payment deduction. If your request is authorized, \$2.50/cu yd is deducted. If CTB is paid for by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant CTB left in place. An aggregate gradation and a sand equivalent test represents up to (1) 500 cu yd or (2) 1 day's production if less than 500 cu yd.

#### 27-1.01D(1)(b) Road-Mixed Cement Treated Base Moisture Content

Just before initial compaction the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content is determined under California Test 312.

#### 27-1.01D(1)(c) Plant-Mixed Cement Treated Base Moisture Content

At the point of delivery to the work, the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content under California Test 312.

#### 27-1.01D(2) Quality Control

27-1.01D(2)(a) General Reserved

27-1.01D(2)(b) Quality Control Plan Reserved 07-15-16

#### 27-1.01D(2)(c) Qualifications

Reserved

#### 27-1.01D(2)(d) Quality Control Testing

CTB quality control must include testing the quality characteristics at the frequencies shown in the following table:

| Quality characteristic            | Test method                     | Sampling location                                                   | Minimum frequency                                                              |  |
|-----------------------------------|---------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------|--|
| Aggregate gradation               | California Test 202<br>modified | Stockpiles, plant,<br>transportation units,<br>windrow, or roadway  | 1 per 500 cu yd but at                                                         |  |
| Sand equivalent                   | California Test 217             | Stockpiles, plant,<br>transportation units,<br>windrow, or roadway  | placement                                                                      |  |
| R-value <sup>a</sup>              | California Test 301             | Stockpiles, plant,<br>transportation units,<br>windrows, or roadway | 1 test before starting work<br>and every 2000 cu yd<br>thereafter <sup>b</sup> |  |
| Optimum moisture<br>content       | California Test 312             | Plant, transportation<br>units, windrow, or<br>roadway              | 1 per day of placement                                                         |  |
| Moisture content                  | California Test 226             | Roadway                                                             | 1 per 500 cu yd but at<br>least one per day of<br>placement                    |  |
| Cement content                    | California Test 338             | Windrows or roadway                                                 | 1 per 1000 cu yd but at<br>least one per day of<br>placement                   |  |
| Relative compaction               | California Test 312 or<br>231   | Roadway                                                             | 1 per 2000 sq yd but at<br>least one per day of<br>placement                   |  |
| Compressive strength <sup>c</sup> | California Test 312             | Windrow or roadways                                                 | 1 per day of placement                                                         |  |

**QC Testing Frequencies** 

<sup>a</sup>R-value is required for Class B CTB only

<sup>b</sup>Additional R-value frequency testing will not be required while the average of 4 consecutive sand equivalent tests is 4 or more above the specified operating range value. <sup>c</sup>Compressive strength is required for Class A CTB only when specified

#### 27-1.01D(3) Department Acceptance

The Department's acceptance testing includes testing the CTB quality characteristics shown in the following table:

| Quality characteristic            | Test method                  |  |  |
|-----------------------------------|------------------------------|--|--|
| Aggregate gradation               | California Test 202 modified |  |  |
| Sand equivalent                   | California Test 217          |  |  |
| R-value <sup>a</sup>              | California Test 301          |  |  |
| Optimum moisture content          | California Test 312          |  |  |
| Moisture content                  | California Test 226          |  |  |
| Cement content                    | California Test 338          |  |  |
| Relative compaction               | California Test 312 or 231   |  |  |
| Compressive strength <sup>b</sup> | California Test 312          |  |  |

| CTB I | Requirements | for | Acceptance |
|-------|--------------|-----|------------|
|-------|--------------|-----|------------|

<sup>a</sup>R-value is required for Class B CTB only

<sup>b</sup>Compressive strength is required for Class A CTB only when specified

The Engineer takes samples for aggregate gradation and sand equivalent from any of the following locations:

1. Plant
2. Truck

- 3. Windrow, for road-mixed only
- 4. Roadbed, for road-mixed only

#### Add to section 27-1.02:

Water must comply with section 90-1.02D.

#### Add to section 27-1.03F:

The relative compaction of CTB must be at least 95 percent.

^^^^

# 28 CONCRETE BASES

#### 07-15-16

#### Replace the headings and paragraphs in section 28-1.01D with:

28-1.01D Quality Assurance

#### 28-1.01D(1) General

Aggregate samples must not be treated with lime, cement, or chemicals before testing for sand equivalent.

Stop concrete base activities and immediately notify the Engineer whenever:

- 1. Any QC or QA test result does not comply with the specifications
- 2. Visual inspection shows a noncompliant concrete base

If concrete base activities are stopped, before resuming activities:

- 1. Notify the Engineer of the adjustments you will make
- 2. Remedy or replace the noncompliant concrete base
- 3. Field qualify or construct a new test strip as specified for the concrete base involved to demonstrate compliance with the specifications
- 4. Obtain authorization

#### 28-1.01D(2) Quality Control

#### 28-1.01D(2)(a) General

Reserved

28-1.01D(2)(b) Quality Control Plan

Reserved

#### 28-1.01D(2)(c) Qualifications

Reserved

28-1.01D(3) Department Acceptance

Reserved

#### Add to section 28-2.01C(1):

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#### Replace the headings and paragraphs in section 28-2.01D with:

#### 28-2.01D Quality Assurance

#### 28-2.01D(1) General

#### 28-2.01D(1)(a) General

The molds for compressive strength testing under ASTM C31 or ASTM C192 must be 6 by 12 inches.

If the aggregate gradation test results, sand equivalent test results or both comply with the contract compliance requirements but not the operating range requirements, you may continue placing LCB for the remainder of the work day. Do not place additional LCB until you demonstrate the LCB to be placed complies with the operating range requirements.

#### 28-2.01D(1)(b) Qualifications

Field qualification tests and calculations must be performed by an ACI certified "Concrete Laboratory Technician, Grade I.

#### 28-2.01D(1)(c) Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. The qualification tests include (1) a sand equivalent and (2) an average 7-day compressive strength under ASTM C39 of 3 cylinders manufactured under ASTM C192 except cure cylinders in molds without lids after initial curing.

For the compressive strength test, the cement content for each cylinder must be 300 lb/cu yd. The 7-day average compressive strength must be at least 610 psi. The cement must be Type II portland cement.

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

#### 28-2.01D(1)(d) Field Qualification Testing

Before placing LCB, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to the authorized mix designs.

Notify the Engineer at least 5 business days before field qualification. Perform the field qualification at the job site or an authorized location.

Field qualification testing includes tests for compressive strength, air content, and penetration or slump.

For compressive strength field qualification testing:

- 1. Prepare 12 cylinders under ASTM C31 except final cure cylinders in molds without lids from a single batch.
- 2. Perform 3 tests; each test consists of determining the average compressive strength of 2 cylinders at 7 days under ASTM C39. The average compressive strength for each test must be at least 530 psi

If you submitted a notice to produce LCB qualifying for a transverse contraction joint waiver, manufacture additional specimens and test the LCB for compressive strength at 3 days. Prepare the compressive strength cylinders under ASTM C31 except final cure cylinders in molds without lids at the same time using the same material and procedures as the 7-day compressive strength cylinders except do not submit 6 additional test cylinders. The average 3-day compressive strength for each test must be not more than 500 psi.

28-2.01D(2) Quality Control

#### 28-2.01D(2)(a) General

Reserved

#### 28-2.01D(2)(b) Quality Control Manager

Reserved

#### 28-2.01D(2)(c) Quality Control Testing

Test the LCB under the test methods and at the locations and frequencies shown in the following table:

| LCB Sampling Location and Testing Frequencies |                       |                   |                           |  |
|-----------------------------------------------|-----------------------|-------------------|---------------------------|--|
| Quality characteristic                        | Test method           | Sampling location | Minimum sampling and      |  |
| -                                             |                       |                   | testing frequency         |  |
| Sand equivalent                               | ASTM D2419            | Source            |                           |  |
| Aggregate gradation                           | ASTM C136             | Source            |                           |  |
| Air content                                   | ASTM C231             |                   | 1 per 500 cubic yards     |  |
| Penetration <sup>a</sup>                      | ASTM C360             |                   | but at least 1 per day of |  |
| Slump <sup>a</sup>                            | ASTM C143             | Job site          | production                |  |
| Compressive strength                          | ASTM C39 <sup>b</sup> |                   |                           |  |
|                                               |                       |                   |                           |  |

<sup>a</sup>Test for either penetration or slump

<sup>b</sup>Prepare cylinders under ASTM C31 except final cure cylinders in molds without lids.

# 28-2.01D(3) Department Acceptance

The Department accepts LCB based on compliance with the requirements shown in the following table:

#### LCB Requirements for Acceptance

| Quality characteristic                                                                           | Test method             | Requirement      |  |
|--------------------------------------------------------------------------------------------------|-------------------------|------------------|--|
| Compressive strength (min, psi at 7 days)                                                        | ) ASTM C39 <sup>a</sup> | 530 <sup>b</sup> |  |
| <sup>a</sup> Cylinders prepared under ASTM C31 except final cure cylinders in molds without lids |                         |                  |  |

<sup>a</sup> Cylinders prepared under ASTM C31 except final cure cylinders in molds without lids. <sup>b</sup> A compressive strength test represents up to (1) 1,000 cu yd or (2) 1 day's production if less than 1,000 cu yd.

Replace section 28-2.01D(4) in item 3 of the 5th paragraph in section 28-2.03D with:

section 28-2.01D(1)(c)

# Replace the 1st paragraph in section 28-2.03F with:

07-15-16 After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03I. Apply curing compound:

- 1. In 2 separate applications
- 2. Before the atmospheric temperature falls below 40 degrees F
- 3. At a rate of 1 gal/150 sq ft for the first application
- 4. At a rate of 1 gal/200 sq ft for the second application

# Replace *Reserved* in section 28-3.01C(3) with:

Submit a rapid strength concrete base QC plan.

# Replace the headings and paragraphs in section 28-3.01D with:

# 28-3.01D Quality Assurance

# 28-3.01D(1) General

# 28-3.01D(1)(a) General

At the preconstruction meeting be prepared to discuss the project specifications and methods of performing each item of work. Items discussed must include the processes for:

- 1. Production
- 2. Transportation

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- 3. Placement
- 4. QC plan, if specified in the special provisions
- 5. Contingency plan
- 6. QC sampling and testing
- 7. Acceptance criteria

Beams for modulus of rupture testing must be fabricated and tested under California Test 524. The beams may be fabricated using an internal vibrator under ASTM C31. For each test, 3 beam must be fabricated and the test results averaged. No single test represents more than that day's production or 130 cu yd, whichever is less.

For early age testing, beams must be cured so the monitored temperatures in the beams and the test strip are always within 5 degrees F. The internal temperatures of the RSC base and early age beams must be monitored and recorded at intervals of at least 5 minutes. Thermocouples or thermistors connected to strip-chart recorders or digital data loggers must be installed to monitor the temperatures. Temperature recording devices must be accurate to within  $\pm 2$  degrees F. Until early age testing is completed, internal temperatures must be measured at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge.

For other age testing, beams must be cured under California Test 524 except beams must be placed into sand at a time that is the earlier of either from 5 to 10 times the final set time, or 24 hours.

RSC base must have an opening age modulus of rupture of not less than 400 psi and a 7-day modulus of rupture of not less than 600 psi.

#### 28-3.01D(1)(b) Preconstruction Meeting

Reserved

28-3.01D(1)(c) Test Strip Reserved

28-3.01D(2) Quality Control 28-3.01D(2)(a) General Reserved

28-3.01D(2)(b) Quality Control Manager Reserved

## 28-3.01D(2)(c) Quality Control Testing

Test the rapid strength concrete base under the test methods and at the locations and frequencies shown in the following table:

|                                | Rapid Oriengin Obnorece Base Gamping Lobation and resting rrequences |                 |                                             |  |  |  |
|--------------------------------|----------------------------------------------------------------------|-----------------|---------------------------------------------|--|--|--|
| Quality characteristic         | Test method                                                          | Sample Location | Minimum testing frequency <sup>a</sup>      |  |  |  |
| Cleanness value                | California Test 227                                                  |                 | 1 per 500 cubic yards but at                |  |  |  |
| Sand equivalent                | California Test 217                                                  | Source          | least 1 per shift                           |  |  |  |
| Aggregate gradation            | California Test 202                                                  |                 |                                             |  |  |  |
| Air content                    | California Test 504                                                  |                 | 1 per 130 cu yd but at least 1 per<br>shift |  |  |  |
| Yield                          | California Test 518                                                  |                 | 1 per shift                                 |  |  |  |
| Slump or penetration           | ASTM C143 or California                                              |                 | 1 per 2 hours of placement                  |  |  |  |
|                                | Test 533                                                             | lob cito        |                                             |  |  |  |
| Density                        | California Test 518                                                  | JOD SILE        | 1 per shift                                 |  |  |  |
| Aggregate moisture             | California Test 223 or                                               |                 | 1 per shift                                 |  |  |  |
| meter calibration <sup>b</sup> | California Test 226                                                  |                 |                                             |  |  |  |
| Modulus of rupture             | California Test 524                                                  |                 | 1 per 130 cu yd but at least 1 per          |  |  |  |
|                                |                                                                      |                 | shift                                       |  |  |  |

**Rapid Strength Concrete Base Sampling Location and Testing Frequencies** 

<sup>a</sup>Test at the most frequent interval.

<sup>b</sup>Check calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Notify the Engineer at least 2 business days before any sampling and testing. Submit testing results within 15 minutes of testing completion. Record inspection, sampling, and testing on the forms accepted with the QC plan and submit them within 48 hours of completion of each day of production and within 24 hours of 7-day modulus of rupture tests.

During the placement of RSC base, fabricate beams and test for the modulus of rupture:

- 1. At opening age
- 2. At 7 days after placing the first 30 cu yd
- 3. At least once every 130 cu yd
- 4. Within the final truckload

Opening age tests must be performed in the presence of the Engineer.

#### 28-3.01D(3) Department Acceptance

The Department accepts RSC base based on compliance with the requirements shown in the following table:

| Not base requirements for Acceptance    |                     |             |  |  |
|-----------------------------------------|---------------------|-------------|--|--|
| Quality characteristic                  | Test method         | Requirement |  |  |
| Modulus of rupture (min, psi at 7 days) | California Test 524 | 600         |  |  |

**RSC Base Requirements for Acceptance** 

The Engineer adjust payment for RSC base for the 7-day modulus of rupture as follows:

- 1. Payment for a base with a modulus of rupture of 600 psi or greater is not adjusted.
- 2. Payment for a base with a modulus of rupture of less than 600 and greater than or equal to 550 psi is reduced by 5 percent.
- 3. Payment for a base with a modulus of rupture of less than 550 and greater than or equal to 500 psi is reduced by 10 percent.
- 4. Payment for a base with a modulus of rupture of less than 500 psi is not adjusted and no payment is made. Remove and replace this base.

#### Add to section 28-4.01C(1):

Submit a lean concrete base rapid setting QC plan.

#### Replace the headings and paragraphs in section 28-4.01D with:

#### 28-4.01D Quality Assurance

#### 28-4.01D(1) General

#### 28-4.01D(1)(a) General

For compressive strength testing, prepare 6 cylinders under California Test 540. Test cylinders must be 6 by 12 inches. As an alternative to rodding, a vibrator may be used under California Test 524. Test cylinders under California Test 521 and perform 3 tests with each test consisting of 2 cylinders. The test result is the average from the 2 cylinders.

#### 28-4.01D(1)(b) Field Qualification

Before placing lean concrete base rapid setting, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to authorized mixed designs.

Proposed mix designs must be field qualified before you place the base represented by those mix designs. The technician performing the field test must hold current ACI certification as a Concrete Field Testing Technician-Grade I.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Lean Concrete Base Rapid Setting Requirements."

Field qualification must comply with the following:

- 1. Test for compressive strength at opening age and 7 days of age
- 2. At opening age, the compressive strength for each test must be at least 180 psi and the average strength for the 3 tests must be at least 200 psi
- 3. At 7 days age, the compressive strength for each test must be at least 600 psi and the average strength for the 3 tests must be at least 725 psi

#### 28-4.01D(2) Quality Control

#### 28-4.01D(2)(a) General

Reserved

#### 28-4.01D(2)(b) Quality Control Manager

Reserved

#### 28-4.01D(2)(c) Quality Control Testing

Test the base under the test methods and at the locations and frequencies shown in the following table:

|                          | LOD Rapid Setting Sampling Location and resting requencies |          |                                          |  |  |
|--------------------------|------------------------------------------------------------|----------|------------------------------------------|--|--|
| Quality characteristic   | Test method                                                | Sampling | Minimum sampling and testing             |  |  |
| -                        |                                                            | location | frequency                                |  |  |
| Sand equivalent          | ASTM D2419                                                 | Sourco   | 1 per 500 cu yd, minimum 1 per day       |  |  |
| Aggregate gradation      | ASTM C136                                                  | Source   | of production                            |  |  |
| Air content              | ASTM C231                                                  |          |                                          |  |  |
| Penetration <sup>a</sup> | ASTM C360                                                  |          | 1 per 4 bours of placement work, plus    |  |  |
| Slump <sup>a</sup>       | ASTM C143                                                  | Job site | appendix the last hour of placement work |  |  |
| Compressive strength     | California Test 521                                        |          | one in the last hour of placement work   |  |  |
|                          |                                                            |          |                                          |  |  |

#### LCB Rapid Setting Sampling Location and Testing Frequencies

<sup>a</sup>Test either penetration or slump

During placement of lean concrete base rapid setting, fabricate cylinders and test compressive strength for opening age and 7 days. Opening age tests must be performed in the presence of the Engineer.

#### 28-4.01D(3) Department Acceptance

The Department accepts LCB rapid setting based on compliance with the requirement shown in the following table:

| LCB Rapid Setting Requirements for Acceptance         |                                  |     |  |  |
|-------------------------------------------------------|----------------------------------|-----|--|--|
| Quality characteristic Test method Requirement        |                                  |     |  |  |
| Compressive strength (min, psi at 7 days)             | California Test 521 <sup>a</sup> | 725 |  |  |
| <sup>a</sup> Cylinders made under California Test 540 |                                  |     |  |  |

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#### Replace the 2nd and 3rd paragraphs in section 28-4.03A with:

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Concrete paving operations with equipment not supported by the base may start before opening age. Do not open pavement for traffic before opening age of the LCB rapid setting.

Any other paving operations must start after the final set time of the base. The base must have a compressive strength of at least 450 psi under California Test 521 before:

- 1. Placing HMA
- 2. Placing other base material
- 3. Operating equipment on the base

#### Replace Reserved in section 28-5.01C with:

Submit a concrete base QC plan.

#### Replace the headings and paragraphs in section 28-5.01D(2) with:

28-5.01D(2) Quality Control 28-5.01D(2)(a) General Reserved

28-5.01D(2)(b) Quality Control Manager

Reserved

#### 28-5.01D(2)(c) Quality Control Testing

Test the concrete base under the test methods and at the locations and frequencies shown in the following table:

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| Concrete Base Sampling Location and Testing Frequencies |                         |                 |                                          |  |
|---------------------------------------------------------|-------------------------|-----------------|------------------------------------------|--|
| Quality characteristic                                  | Test method             | Sample location | Minimum testing frequency <sup>a</sup>   |  |
| Cleanness value                                         | California Test 227     |                 | 1 per 500 cubic yards but at             |  |
| Sand equivalent                                         | California Test 217     | Source          | least 1 per shift                        |  |
| Aggregate gradation                                     | California Test 202     |                 |                                          |  |
| Air content                                             | California Test 504     |                 | 1 per 500 cu yd but at least 1 per shift |  |
| Yield                                                   | California Test 518     |                 | 1 per shift                              |  |
| Slump or penetration                                    | ASTM C143 or California |                 | 1 per 2 hours of placement               |  |
|                                                         | Test 533                | lob site        |                                          |  |
| Density                                                 | California Test 518     | JOD SILE        | 1 per shift                              |  |
| Aggregate moisture                                      | California Test 223 or  |                 | 1 per shift                              |  |
| meter calibration <sup>b</sup>                          | California Test 226     |                 |                                          |  |
| Modulus of rupture                                      | California Test 524     |                 | 1 per 500 cu yd but at least 1 per       |  |
|                                                         |                         |                 | shift                                    |  |

<sup>a</sup>Test at the most frequent interval.

<sup>b</sup>Check calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

#### 28-5.01D(3) Department Acceptance

The Department accepts a concrete base based on compliance with the requirements shown in the following table:

#### **Concrete Base Requirements for Acceptance**

| Quality characteristic                   | Test method         | Requirement |
|------------------------------------------|---------------------|-------------|
| Modulus of rupture (min, psi at 28 days) | California Test 523 | 570         |

Acceptance for the modulus of rupture is on a lot basis. The Department provides the molds and machines for the modulus of rupture acceptance testing. Provide any material and labor the Engineer may require for the testing.

#### ^^^^

# 29 TREATED PERMEABLE BASES

07-15-16

#### Replace the headings and paragraphs in section 29-1.01 with:

29-1.01 GENERAL

29-1.01A Summary

Section 29-1 includes general specifications for constructing treated permeable bases.

29-1.01B Definitions

Reserved

#### 29-1.01C Submittals

Submit a treated permeable base quality control plan.

#### 29-1.01D Quality Assurance

29-1.01D(1) General

Reserved

29-1.01D(2) Quality Control 29-1.01D(2)(a) General Reserved

29-1.01D(2)(b) Quality Control Plan

Reserved

29-1.01D(2)(c) Qualifications

Reserved

# 29-1.01D(3) Department Acceptance

Reserved

#### Replace the headings and paragraphs in section 29-2.01D with:

#### 29-2.01D Quality Assurance

29-2.01D(1) General

The Engineer determines the asphalt content of the asphalt mixture under California Test 382. The bitumen ratio, pounds of asphalt per 100 lb of dry aggregate, must not vary more than 0.5 lb of asphalt above or below the quantity designated by the Engineer. Samples used to determine the bitumen ratio are obtained from trucks at the plant or from the mat behind the paver before rolling. If the sample is taken from the mat behind the paver, the bitumen ratio must not be less than the quantity designated by the Engineer, less 0.7 lb of asphalt per 100 lb of dry aggregate.

#### 29-2.01D(2) Quality Control

29-2.01D(2)(a) General

Reserved

#### 29-2.01D(2)(b) Quality Control Testing

ATPB quality control must include testing the quality characteristics at the frequencies shown in the following table:

| Quality characteristic      | Test method     | Sampling location     | Minimum frequency            |
|-----------------------------|-----------------|-----------------------|------------------------------|
| Gradation                   | California Test | Stockpiles or plant   | 1 for every 4 hours of       |
|                             | 202             |                       | production but at least one  |
|                             |                 |                       | per day of placement         |
| Cleanness value             | California Test | Stockpiles or plant   | 1 for every 4 hours of       |
|                             | 227             |                       | production but at least one  |
|                             |                 |                       | per day                      |
| Percentage of crushed       | California Test | Stockpiles or plant   | 1 test before production and |
| particles                   | 205             |                       | one every 5,000 cu yd        |
|                             |                 |                       | thereafter                   |
| Los Angeles rattler loss at | California Test | Stockpiles or plant   | 1 test before production and |
| 500 rev                     | 211             |                       | one every 5,000 cu yd        |
|                             |                 |                       | thereafter                   |
| Film stripping              | California Test | Plant                 | 1 test before production and |
|                             | 302             |                       | one every 5000 cu yd         |
|                             |                 |                       | thereafter                   |
| Asphalt content of the      | California Test | Plant, transportation | 1 for every 4 hours of       |
| asphalt mixture             | 382             | units, windrows, or   | production but at least one  |
|                             |                 | roadway               | per day                      |

#### **QC Testing Frequencies**

#### 29-2.01D(3) Department Acceptance

The Department accepts ATPB based on aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, film stripping and asphalt content requirements specified in section 29-2.02 and section 29-2.01D(1).

The Engineer takes samples for aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, and film stripping from the plant.

The Engineer takes samples for asphalt content of the asphalt mixture from any of the following locations:

- 1. Plant
- 2. Truck
- 3. Windrow
- 4. Roadbed

#### Replace the headings and paragraphs in section 29-3.01 with:

07-15-16

#### 29-3.01 GENERAL

#### 29-3.01A Summary

Section 29-3 includes specifications for constructing cement treated permeable bases.

#### 29-3.01B Definitions

Reserved

#### 29-3.01C Submittals

Reserved

#### 29-3.01D Quality Assurance

#### 29-3.01D(1) General

Reserved

# 29-3.01D(2) Quality Control 29-3.01D(2)(a) General

Reserved

#### 29-3.01D(2)(b) Quality Control Testing

CTPB quality control must include testing the quality characteristics at the frequencies shown in the following table:

#### **QC Testing Frequencies** Quality characteristic Test method Sampling location Minimum frequency Gradation 1 for every 4 hours of California Test Stockpiles or plant 202 production but at least one per day of placement Cleanness value California Test Stockpiles or plant 1 for every 4 hours of production but at least one 227 per day Los Angeles rattler California Test Stockpiles or plant 1 test before production and loss at 500 rev 211 one every 5,000 cu yd thereafter Soundness California Test Stockpiles or plant 1 test before production and one every 5,000 cu vd 214 thereafter

#### 29-3.01D(3) Department Acceptance

The Department accepts CTPB based on aggregate gradation, cleanness value, Los Angeles rattler and soundness requirements in section 29-3.02.

The Engineer takes samples for aggregate gradation, cleanness value, Los Angeles rattler and soundness from the plant.

#### Add to section 29-3.02A:

Water must comply with section 90-1.02D.

Replace 3rd in the 2nd paragraph in section 29-3.03 with:

4th

^^^^

# **30 RECLAIMED PAVEMENT**

07-15-16

Replace section 30-1.01C(2)(c) in the 1st paragraph of section 30-3.01C(2)(c) with:

section 30-1.01C(3)(c)

07-15-16

07-15-16

#### Replace the table in section 30-3.02A with:

| Quality characteristic                                                  | Test method         | Requirement             |
|-------------------------------------------------------------------------|---------------------|-------------------------|
| Moisture content before HMA paving                                      | California Test 226 | < 50% of OMC            |
| Asphalt binder expansion ratio (min, %)                                 | Noto o              | 10                      |
| Asphalt binder half-life<br>(seconds, min)                              | Note a              | 12                      |
| Gradation (%, passing)<br>Sieve Size:<br>3 inch<br>2 inch<br>1-1/2 inch | California Test 202 | 100<br>95–100<br>85–100 |
| Moisture content<br>Maximum<br>Minimum                                  | California Test 226 | OMC<br>OMC - 2%         |
| In-place wet density<br>(lb/cu ft)                                      | California Test 216 | Report only             |
| Relative compaction<br>(min, %)                                         | California Test 231 | 98                      |
| Indirect dry tensile strength (psi)                                     | California Test 371 | 90% of mix design value |
| Indirect wet tensile strength (psi) <sup>b</sup>                        | California Test 371 | 90% of mix design value |
| Tensile strength ratio<br>(%)                                           | California Test 371 | 90% of mix design value |

FDR—Foamed Asphalt Quality Characteristic Requirements

<sup>a</sup>Test at the foaming temperature and percentage of foaming water by dry weight of FDR—foamed asphalt material designated in the mix design. To test asphalt binder expansion ratio and half-life, use a pail of known volume and a dipstick calibrated for the pail. From the inspection nozzle on the asphalt binder spray bar, inject foamed asphalt into the pail without exceeding the pail's capacity. With the dipstick, immediately measure and record the level of foamed asphalt in the pail. Record the half-life in seconds from the time the injection of foamed asphalt in the pail is turned off to half the dip stick reading after peak. Calculate the expansion ratio as the volume of the foamed asphalt upon injection divided by the volume of the unfoamed asphalt binder.

<sup>b</sup>From material passing the 1-inch sieve, compact 6 specimens under California Test 304, Part 2. Cure the specimens at 100 °F for 72 hours and allow the specimens to cool to room temperature. Test 3 specimens for dry tensile strength under California Test 371. Test 3 specimens for wet tensile strength under California Test 371 after moisture conditioning.

#### Replace section 30-4.01D(3) in the 2nd paragraph of section 30-4.01D(1) with:

section 30-4.01D(4)

#### Replace section 30-4.01D(1)(a) in the table in section 30-4.02A with:

section 30-4.01D(2)

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07-15-16

# DIVISION V SURFACINGS AND PAVEMENTS

# **37 BITUMINOUS SEALS**

07-15-16 Replace section 37 with:

07-15-16

#### 37 SEAL COATS 37-1 GENERAL

#### 37-1.01 GENERAL

#### 37-1.01A Summary

Section 37-1 includes general specifications for applying seal coats.

#### 37-1.01B Definitions

Reserved

#### 37-1.01C Submittals

At least 10 days before the preconstruction meeting submit a list of participants in the preconstruction meeting. Provide each participant's name, employer, title, and role in the production and placement of the seal coats.

At least 10 days before starting seal coat activities, submit the names of the authorized laboratories for quality control testing.

For each delivery of asphalt binder or asphaltic emulsion to the job site, submit a certificate of compliance and a copy of the specified test results.

For a seal coat that uses crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of project.

#### 37-1.01D Quality Assurance

#### 37-1.01D(1) General

For aggregate testing, quality control laboratories must be in compliance with the Department's Independent Assurance Program to be an authorized laboratory. Quality control personnel must be qualified under the Department's Independent Assurance Program.

For emulsion testing, quality control laboratories must participate in the AASHTO Material's Reference Laboratory proficiency sample program.

#### 37-1.01D(2) Preconstruction Meeting

Hold a preconstruction meeting within 5 days before start of seal coat work at a mutually agreed time and place with the Engineer and your:

- 1. Project superintendent
- 2. Project foreman
- 3. Traffic control foreman

Make arrangements for the conference facility. Preconstruction meeting participants must sign an attendance sheet provided by the Engineer. Be prepared to discuss:

- 1. Quality control testing
- 2. Acceptance testing
- 3. Seal coat placement
- 4. Proposed application rates for asphaltic emulsion or asphalt binder and aggregate.
- 5. Training on placement methods
- 6. Checklist of items for proper placement
- 7. Unique issues specific to the project, including:
  - 7.1. Weather
  - 7.2. Alignment and geometrics
  - 7.3. Traffic control requirements

- 7.4. Haul distances
- 7.5. Presence and absence of shaded areas
- 7.6. Any other local conditions
- 8. Contingency plan for material deliveries, equipment breakdowns, and traffic handling
- 9. Who in the field has authority to adjust application rates and how adjustments will be documented
- 10. Schedule of sweepings

#### 37-1.02 MATERIALS

Not Used

#### 37-1.03 CONSTRUCTION

#### 37-1.03A General

If seal coat activities affect access to public parking, residential property, or commercial property, post signs at 100-foot intervals on the affected streets. Signs must display *No Parking – Tow Away*. Signs must state the dates and hours parking or access will be restricted. Notify residents, businesses, and local agencies at least 24 hours before starting activities. The notice must:

- 1. Describe the work to be performed
- 2. Detail streets and limits of activities
- 3. Indicate dates and work hours
- 4. Be authorized

Asphaltic emulsion or asphalt binder for seal coats may be reheated if necessary. After loading the asphaltic emulsion or asphalt binder into a truck for transport to the job site, do not heat asphaltic emulsion above 160 degrees F and asphalt rubber binder above 425 degrees F. During reheating, circulate or agitate the asphaltic emulsion or asphalt binder to prevent localized overheating.

Except for fog seals, apply quick setting Grade 1 asphaltic emulsions at a temperature from 75 to 130 degrees F and apply quick setting Grade 2 asphaltic emulsions at a temperature from 110 to 185 degrees F.

You determine the application rates for asphaltic emulsion or asphalt binder and aggregate and the Engineer authorizes the application rates.

#### 37-1.03B Equipment

A self-propelled distributor truck for applying asphaltic emulsion or asphalt binder must be equipped with:

- 1. Pressure-type system with insulated tanks with circulating unit
- 2. Spray bars:
  - 2.1. With minimum length of 9 feet and full-circulating type
  - 2.2. With full-circulating-type extensions if needed to cover a greater width
  - 2.3. Adjustable to allow positioning at various heights above the surface to be treated
  - 2.4. Operated by levers such that 1 or all valves may be quickly opened or closed in one operation
- 3. Devices and charts to provide for accurate and rapid determination and control of asphaltic emulsion or asphalt binder quantities being applied. Include an auxiliary wheel type meter that registers:
  - 3.1. Speed in ft/min
  - 3.2. Trip by count
  - 3.3. Total distance in feet
- 4. Distribution system:
  - 4.1. Capable of producing a uniform application of asphaltic emulsion or asphalt binder in controlled quantities ranging from 0.02 to 1 gal/sq yd of surface and at a pressure ranging from 25 to 75 psi
  - 4.2. Pumps that spray asphaltic emulsion or asphalt binder within 0.02 gal/sq yd of the set rate
  - 4.3. With a hose and nozzle for application of asphaltic emulsion to areas inaccessible to the spray bar
  - 4.4. With pressure gauges and a thermometer for determining temperatures of the asphaltic emulsion or asphalt binder

You may use cab-controlled valves for the application of asphaltic emulsion or asphalt binder. The valves controlling the flow from nozzles must act positively to provide a uniform unbroken application of asphaltic emulsion or asphalt binder.

Maintain distributor and storage tanks at all times to prevent dripping.

#### 37-1.04 PAYMENT

Not Used

#### 37-2 CHIP SEALS

### 37-2.01 GENERAL

#### 37-2.01A General

#### 37-2.01A(1) Summary

Section 37-2.01 includes general specifications for applying chip seals.

#### 37-2.01A(2) Definitions

Reserved

#### 37-2.01A(3) Submittals

At least 15 days before starting placement of chip seal, submit:

- 1. Samples for:
  - 1.1. Asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
  - 1.2. Polymer modified asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
  - 1.3. Asphalt rubber binder chip seal, two 1-quart cans of base asphalt binder
  - 1.4. Asphalt rubber binder chip seal, five 1-quart cans of asphalt rubber binder
- 2. Asphaltic emulsion, polymer modified asphaltic emulsion, asphalt binder or asphalt rubber binder data as follows:
  - 2.1. Supplier and Type/Grade of asphaltic emulsion or asphalt binder
  - 2.2. Type of modifier used including polymer or crumb rubber or both
  - 2.3. Percent of crumb rubber, if used as modifier
  - 2.4. Copy of the specified test results for asphaltic emulsion or asphalt binder
- 3. 50 lb of uncoated aggregate
- 4. Aggregate test results for the following:
  - 4.1. Gradation
  - 4.2. Los Angeles Rattler
  - 4.3. Percent of crushed particles
  - 4.4. Flat and elongated particles
  - 4.5. Film stripping
  - 4.6. Cleanness value
  - 4.7. Durability
- 5. Vialit test results

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

| quality control root noot                              |                                  |
|--------------------------------------------------------|----------------------------------|
| Quality characteristic                                 | Maximum reporting time allowance |
| Los Angeles Rattler loss (max, %)                      | 48 hours                         |
| Percent of crushed particles (min, %)                  | 48 hours                         |
| Flat and elongated particles (max by weight at 3:1, %) | 48 hours                         |
| Film stripping (max, %)                                | 48 hours                         |
| Durability (min)                                       | 48 hours                         |
| Gradation (percentage passing)                         | 24 hours                         |
| Cleanness value (min)                                  | 24 hours                         |
| Asphaltic emulsion spread rate (gal/sq yd)             | 24 hours                         |

#### **Quality Control Test Result Reporting**

Within 3 days after taking asphaltic emulsion or asphalt binder quality control samples, submit the authorized laboratory's test results.

37-2.01A(4) Quality Assurance

37-2.01A(4)(a) General

Reserved

37-2.01A(4)(b) Quality Control 37-2.01A(4)(b)(i) General Reserved

# 37-2.01A(4)(b)(ii) Aggregate

All tests must be performed on uncoated aggregate except for film stripping which must be performed on precoated aggregate.

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

| Quality characteristic                                                                                                                                                       | Test method            | Minimum<br>sampling<br>and testing<br>frequency | Location of sampling       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------|----------------------------|
| Los Angeles Rattler loss (max, %)<br>At 100 revolutions                                                                                                                      | California Test<br>211 | 1st day of production                           | See California<br>Test 125 |
| Percent of crushed particles                                                                                                                                                 |                        |                                                 |                            |
| Coarse aggregate (min, %)<br>One-fractured face<br>Two-fractured faces<br>Fine aggregate (min, %)<br>(Passing No. 4 sieve and retained on No. 8 sieve)<br>One fractured face | AASHTO T 335           | 1st day of production                           | See California<br>Test 125 |
| Flat and elongated particles (max by weight at 3:1, %)                                                                                                                       | ASTM D4791             | 1st day of<br>production                        | See California<br>Test 125 |
| Film stripping (max, %)                                                                                                                                                      | California Test<br>302 | 1st day of production                           | See California<br>Test 125 |
| Durability (min)                                                                                                                                                             | California Test<br>229 | 1st day of<br>production                        | See California<br>Test 125 |
| Gradation (% passing)                                                                                                                                                        | California Test<br>202 | 2 per day                                       | See California<br>Test 125 |
| Cleanness value (min)                                                                                                                                                        | California Test<br>227 | 2 per day                                       | See California<br>Test 125 |

#### Aggregate Quality Control Requirements

# 37-2.01A(4)(b)(iii) Chip Seals

For a chip seal, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

| Chip Seal Quality Control Requirements            |                        |                                    |                  |  |
|---------------------------------------------------|------------------------|------------------------------------|------------------|--|
| Quality characteristic Test method                |                        | Minimum sampling                   | Location of      |  |
|                                                   |                        | and testing frequency              | sampling         |  |
| Asphaltic emulsion binder spread rate (gal/sq yd) | California<br>Test 339 | 1 per day per<br>distributor truck | Pavement surface |  |

#### Chip Seal Quality Control Requirements

# 37-2.01A(4)(c) Department Acceptance

Department Acceptance shall not apply to identified areas where the existing surfacing before application of chip seal, contains defective areas as determined by the Engineer and Contractor. At least 7 days

before starting placement of the chip seal, the Contractor shall submit a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway post mile locations, and defect type. The Engineer must agree on which of the identified areas are defective.

Defective areas are defined as one of the following:

- 1. Areas with wheel path rutting in excess of 3/8 inch when measured by placing a straightedge 12 feet long on the finished surface perpendicular to the center line and measuring the vertical distance between the finished surface and the lower edge of the straightedge
- 2. Areas exhibiting flushing

For a chip seal, acceptance is based on visual inspection for the following:

- 1. Uniform surface texture
- 2. Raveling, which consists of the separation of the aggregate from the asphaltic emulsion or asphalt binder
- 3. Flushing, which consists of the occurrence of a film of asphaltic material on the surface of the chip seal.
- 4. Streaking, which consists of alternating longitudinal bands of asphaltic emulsion or asphalt binder without uniform aggregate retention, approximately parallel with the lane line.

Areas of raveling, flushing or streaking that are greater than 0.5 sq ft shall be considered defective and must be repaired.

Raveling and streaking must be repaired by placing an additional layer of chip seal over the defective area.

For asphaltic emulsion or asphalt binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

For aggregate, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                                 | Test method         | Requirements           |
|--------------------------------------------------------|---------------------|------------------------|
| Los Angeles Rattler loss (max, %)                      |                     |                        |
| At 100 revolutions                                     | California Test 211 | 10                     |
| At 500 revolutions                                     |                     | 40                     |
| Percent of crushed particles:                          | AASHTO T 335        |                        |
| Coarse aggregate (min, %)                              |                     |                        |
| One-fractured face                                     |                     | 95                     |
| Two-fractured faces                                    |                     | 90                     |
| Fine aggregate (min, %)                                |                     |                        |
| (Passing No. 4 sieve and retained on No. 8 sieve)      |                     |                        |
| One fractured face                                     |                     | 70                     |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791          | 10                     |
| Film stripping (max, %)                                | California Test 302 | 25                     |
| Durability (min)                                       | California Test 229 | 52                     |
| Gradation (% passing by weight)                        | California Test 202 | Aggregate Gradation    |
|                                                        |                     | table shown under      |
|                                                        |                     | Materials for the chip |
|                                                        |                     | seal type specified.   |
| Cleanness value (min)                                  | California Test 227 | 80                     |

#### Chip Seal Aggregate Acceptance Criteria

If test results for the aggregate gradation do not comply with specifications, you may remove the chip seal represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the aggregate represented by the test results.

If test results for aggregate cleanness value do not comply with the specifications, you may remove the chip seal represented by these tests or you may request that the chip seal remain in place with a pay deduction corresponding to the cleanness value shown in the following table:

| Deduction   |
|-------------|
| None        |
| \$2.00 /ton |
| \$4.00 /ton |
| \$6.00 /ton |
|             |

#### **Chip Seal Cleanness Value Deductions**

If the aggregate cleanness value is less than 75, remove the chip seal.

#### 37-2.01B Materials

37-2.01B(1) General

Reserved

#### 37-2.01B(2) Asphaltic Emulsions and Asphalt Binders

Reserved

# 37-2.01B(3) Aggregate

#### 37-2.01B(3)(a) General

Aggregate must be broken stone, crushed gravel, or both.

Aggregate must comply with the requirements shown in the following table:

| Quality characteristic                                 | Test method         | Requirements           |
|--------------------------------------------------------|---------------------|------------------------|
| Los Angeles Rattler loss (max, %)                      |                     |                        |
| At 100 revolutions                                     | California Test 211 | 10                     |
| At 500 revolutions                                     |                     | 40                     |
| Percent of crushed particles                           | AASHTO T 335        |                        |
| Coarse aggregate (min, %)                              |                     |                        |
| One-fractured face                                     |                     | 95                     |
| Two-fractured faces                                    |                     | 90                     |
| Fine aggregate (min, %)                                |                     |                        |
| (Passing No. 4 sieve and retained on No. 8 sieve)      |                     |                        |
| One fractured face                                     |                     | 70                     |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791          | 10                     |
| Film stripping (max, %)                                | California Test 302 | 25                     |
| Durability (min)                                       | California Test 229 | 52                     |
| Gradation (% passing by weight)                        | California Test 202 | Aggregate Gradation    |
|                                                        |                     | table shown under      |
|                                                        |                     | Materials for the chip |
|                                                        |                     | seal type specified.   |
| Cleanness value (min)                                  | California Test 227 | 80                     |

#### Chip Seal Aggregate Requirements

The authorized laboratory must conduct the Vialit test using the proposed asphaltic emulsion or asphalt binder and aggregate for compliance with the requirements shown in the following table:

#### **Chip Retention Requirements**

| Quality characteristic | Test method                                                                            | Requirement |
|------------------------|----------------------------------------------------------------------------------------|-------------|
| Chip retention (%)     | Vialit test method for aggregate in chip seals,<br>French chip (Modified) <sup>a</sup> | 95          |

<sup>a</sup>The asphaltic emulsion or asphalt binder must be within the field placement temperature range and application rate during specimen preparation. For asphalt binder cure the specimen for first 2 hours at 100 °F.

#### 37-2.01B(3)(b) Precoated Aggregate

Precoating of aggregate must be performed at a central mixing plant. The plant must be authorized under the Department's *MPQP*.

When precoating aggregate, do not recombine fine materials collected in dust control systems.

Precoated aggregate must be preheated from 260 to 325 degrees F. Coat with any of the asphalts specified in the table titled "Performance Graded Asphalt Binder" in section 92. The asphalt must be from 0.5 to 1.0 percent by weight of dry aggregate. You determine the exact asphalt rate for precoating of aggregate.

Do not stockpile precoated aggregate.

#### 37-2.01C Construction

#### 37-2.01C(1) General

For chip seals on 2-lane, 2-way roadways, place a W8-7 (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along each side of the traveled way where aggregate is spread on a traffic lane and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign in each direction where traffic first encounters the loose aggregate, regardless of which lane the aggregate is spread on. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

For chip seals on freeways, expressways, and multilane conventional highways, place a W8-7, (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along the outside edge of the traveled way nearest to the lane worked on, at on ramps, and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign where the aggregate starts with respect to the direction of travel on that lane. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

Pilot cars must have cellular or radio contact with other pilot cars and personnel in the work zone. The maximum speed of the pilot cars convoying or controlling traffic through the traffic control zone must be 15 mph on 2-lane, two-way highways and 25 mph on multilane divided and undivided highways. Pilot cars must only use traffic lanes open to traffic.

On the days that closures are not allowed, you may use a moving closure to maintain the seal coat surface. The moving closure is only allowed during daylight hours when traffic will be the least inconvenienced and delayed. The Engineer determines the hours for the moving closure.

Maintain signs in place at each location until the final sweeping of the chip seal surface for that location is complete. Signs may be set on temporary portable supports with the W13-1 sign below the W8-7 sign or on barricades with the W13-1 sign alternating with the W8-7 sign.

Schedule chip seal activities so that the chip seals are placed on both lanes of the traveled way each work shift.

If traffic is routed over a surface where a chip seal application is intended, the chip seal must not be applied to more than half the width of the traveled way at a time, and the remaining width must be kept free of obstructions and open to traffic until the previously applied width is ready for traffic use.

Wherever maintenance sweeping of the chip seal surface is complete, place permanent traffic stripes and pavement markings within 10 days.

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the chip seal work completed that has not received permanent traffic stripes and pavement markings.

#### 37-2.01C(2) Equipment

Equipment for chip seals must include and comply with the following:

- 1. Aggregate haul trucks must have:
  - 1.1. Tailgate that discharge aggregate
  - 1.2. Device to lock onto the rear aggregate spreader hitch
  - 1.3. Dump bed that will not push down on the spreader when fully raised
  - 1.4. Dump bed that will not spill aggregate on the roadway when transferred to the spreader hopper
  - 1.5. Tarpaulin to cover precoated aggregate when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
- 2. Self-propelled aggregate spreaders must have:
  - 2.1. Aggregate hopper in the rear
  - 2.2. Belt conveyor that carries the aggregate to the front
  - 2.3. Spreading hopper capable of providing a uniform aggregate spread rate over the entire width of the traffic lane in 1 application.
- 3. Self-propelled power brooms must:
  - 3.1. Not be steel-tined brooms on emulsion chip seals
  - 3.2. Be capable of removing loose aggregate adjacent to barriers that prevent aggregate from being swept off the roadway, including curbs, gutters, dikes, berms, and railings
- 4. Pneumatic or foam filled rubber tired rollers must:
  - 4.1. Be an oscillating type at least 4 feet wide
  - 4.2. Be self-propelled and reversible
  - 4.3. Have tires of equal size, diameter, type, and ply
  - 4.4. Carry at least 3,000 lbs of load on each wheel
  - 4.5 Have tires with an air pressure of  $100 \pm 5$  psi or be foam filled

#### 37-2.01C(3) Surface Preparation

Before applying chip seals, cover manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after the application of the chip seal.

Immediately before applying chip seals, clean the surface to receive a chip seal by removing any extraneous material affecting adhesion of the chip seal with the existing surface and drying. Use self-propelled power brooms to clean the existing pavement.

#### 37-2.01C(4) Placement

#### 37-2.01C(4)(a) General

Schedule the operations so that chip seals are placed on both lanes of the traveled way each work shift. At the end of the work shift, the end of the chip seals on both lanes must generally match.

#### 37-2.01C(4)(b) Applying Asphaltic Emulsions or Asphalt Binders

Prevent spraying on existing pavement not intended for chip seals or on previously applied chip seals using a material such as building paper. Remove the material after use.

Align longitudinal joints between chip seal applications with designated traffic lanes.

For asphaltic emulsion or asphalt binder, overlap longitudinal joints by not more than 4 inches. You may overlap longitudinal joints up to 8 inches if authorized.

For areas not accessible to a truck distributor bar apply:

- 1. Asphaltic emulsions by hand spraying
- 2. Asphalt binders with a squeegee or other authorized means

You may overlap the asphaltic emulsion or asphalt binder applications before the application of aggregate at longitudinal joints.

Do not apply the asphaltic emulsion or asphalt binder unless there is sufficient aggregate at the job site to cover the asphaltic emulsion or asphalt binder.

Discontinue application of asphaltic emulsion or asphalt binder early enough to comply with lane closure requirements. Apply to 1 lane at a time and cover the lane width entirely in 1 operation.

# 37-2.01C(4)(c) Spreading Aggregates

#### 37-2.01C(4)(c)(i) General

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading aggregate.

Spread aggregate within 10 percent of your determined rate.

Spread aggregate at a uniform rate over the full lane width in 1 application. Apply to 1 lane at a time.

Sweep excess aggregate at joints before spreading adjacent aggregate.

Operate the spreader at speeds slow enough to prevent aggregate from rolling over after dropping.

If the spreader is not moving, aggregate must not drop. If you stop spreading and aggregate drops, remove the excess aggregate before resuming activities.

#### 37-2.01C(4)(c)(ii) Precoated Aggregate Application

During transit, cover precoated aggregate with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

When applied, precoated aggregate must be from 225 to 325 degrees F.

#### 37-2.01C(4)(d) Finishing

#### 37-2.01C(4)(d)(i) General

Remove piles, ridges, or unevenly distributed aggregate. Repair permanent ridges, bumps, streaks or depressions in the finished surface. Spread additional aggregate and roll if aggregate is picked up by rollers or vehicles.

Chip seal joints between adjacent applications of a chip seal must be smooth, straight, uniform, and completely covered.

A coverage is 1 roller movement over the entire width of lane. A pass is 1 roller movement parallel to the chip seal application in either direction. Overlapping passes are part of the coverage being made and are not part of a subsequent coverage. Do not start a new coverage until completing the previous coverage.

Before opening to traffic, finish the chip seals in the following sequence:

- 1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
- 2. Perform final rolling consisting of 2 coverages with a pneumatic-tired roller
- 3. Sweep excess aggregate from the roadway and adjacent abutting areas
- 4. Apply a flush coat if specified
- 5. Remove covers from the facilities

#### 37-2.01C(4)(d)(ii) Traffic Control With Pilot Car

For 2-lane 2-way roadways under 1-way traffic control, upon completion of final rolling, traffic must be controlled with pilot cars and routed over the new chip seal for a period of 2 to 4 hours before opening the lane to traffic not controlled with pilot cars.

For multilane roadways, when traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to traffic. Traffic must be controlled with pilot cars and be routed on the new chip seal surface of the lane for a minimum of 2 hours after completion of the initial sweeping and before opening the lane to traffic not controlled with pilot cars. Once traffic controlled with pilot cars is routed over the chip seal at a particular location, continuous control must be maintained at that location until the chip seal placement and sweeping on adjacent lanes to receive a chip seal is completed.

#### 37-2.01C(4)(d)(iii) Sweeping

Sweeping must be performed after the chip seal has set and there is no damage or dislodging of aggregate from the chip seal surface. As a minimum, sweeping is required at the following times:

- 1. On 2-lane 2-way roadways, from 2 to 4 hours after traffic, controlled with pilot cars, has been routed on the chip seal
- 2. On multilane roadways, from 2 to 4 hours after aggregate have been placed
- 3. In addition to previous sweeping, perform final sweeping immediately before opening any lane to public traffic, not controlled with pilot cars

#### 37-2.01C(4)(d)(iv) Excess Aggregate

Dispose of excess aggregate. If ordered, salvaging and stockpiling of excess aggregate is change order work.

#### 37-2.01C(4)(e) Chip Seal Maintenance

Perform sweeping on the morning following the application of aggregate on any lane that has been open to traffic not controlled with pilot cars and before starting any other activities.

Chip seal surfaces must be maintained for 4 consecutive days from the day aggregate is applied. Maintenance must include sweeping to maintain a surface free of loose aggregate and to prevent formation of corrugations. Sweeping must not dislodge aggregate set in asphaltic emulsion or asphalt binder.

After 4 consecutive days, excess aggregate must be removed from the paved areas.

#### 37-2.01D Payment

If there is no bid item for traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the chip seal.

The payment quantity for precoated aggregate is the weight measured after the aggregate is preheated and precoated with asphalt binder.

If recorded batch weights are printed automatically, the payment quantity for aggregate is the weight determined from the printed batch weights if:

- 1. Total weight for the precoated aggregate per batch is printed
- 2. Total asphalt binder weight per batch is printed
- 3. Zero tolerance weight is printed before weighing the first batch and after weighing the last batch for each truckload
- 4. Time, date, mix number, load number, and truck identification are correlated with a load slip
- 5. Copy of the recorded batch weights is certified by a licensed weighmaster

#### 37-2.02 ASPHALTIC EMULSION CHIP SEALS

#### 37-2.02A General

#### 37-2.02A(1) Summary

Section 37-2.02 includes specifications for applying asphaltic emulsion chip seals. An asphaltic emulsion chip seal includes applying an asphaltic emulsion, followed by aggregate, and then a flush coat.

A double asphaltic emulsion chip seal is the application of an asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

#### 37-2.02A(2) Definitions

Reserved

#### 37-2.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic containers of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

# 37-2.02A(4) Quality Assurance 37-2.02A(4)(a) General

Reserved

#### 37-2.02A(4)(b) Quality Control 37-2.02A(4)(b)(i) General

Reserved

#### 37-2.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsion in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples in a plastic container with lined sealed lid for acceptance testing.

For asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| Asphaltic Emulsion                       |             |                       |                   |  |
|------------------------------------------|-------------|-----------------------|-------------------|--|
| Quality characteristic                   | Test method | Minimum sampling and  | Sampling location |  |
|                                          |             | testing frequency     |                   |  |
| Saybolt Furol Viscosity, at 25 °C        |             |                       |                   |  |
| (Saybolt Furol seconds)                  |             |                       |                   |  |
| Sieve Test (%)                           |             | Minimum 1 per day per | Distributor trusk |  |
| Storage stability, 1 day (%)             | AASHIU 1 59 | delivery truck        |                   |  |
| Residue by distillation (%)              |             |                       |                   |  |
| Particle charge <sup>a</sup>             |             |                       |                   |  |
| Tests on Residue from Distillation Test: |             |                       |                   |  |
| Penetration, 25 °C                       | AASHTO T 49 |                       |                   |  |
| Ductility                                | AASHTO T 51 | delivery truck        | Distributor truck |  |
| Solubility in trichloroethylene          | AASHTO T 44 |                       |                   |  |

<sup>a</sup>If the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

#### 37-2.02A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

|                                             | •                   |        |             |       |
|---------------------------------------------|---------------------|--------|-------------|-------|
| Quality characteristic                      | Test method         |        | Requirement |       |
| Gradation (% passing by weight) Sieve size: |                     | 3/8"   | 5/16"       | 1/4"  |
| 3/4"                                        |                     |        |             |       |
| 1/2"                                        | California Test 202 | 100    |             |       |
| 3/8"                                        |                     | 85–100 | 100         | 100   |
| No. 4                                       |                     | 0–15   | 0–50        | 60–85 |
| No. 8                                       |                     | 0–5    | 0–15        | 0–25  |
| No. 16                                      |                     |        | 0–5         | 0–5   |
| No. 30                                      |                     |        | 0–3         | 0–3   |
| No. 200                                     |                     | 0–2    | 0–2         | 0–2   |

#### Aggregate Gradation Acceptance Criteria

37-2.02B Materials 37-2.02B(1) General Reserved

#### 37-2.02B(2) Asphaltic Emulsions

Reserved

#### 37-2.02B(3) Aggregate

Aggregate gradation for an asphaltic emulsion chip seal must comply with the requirements shown in the following table:

| Quality characteristic                      | Test method     | R      | equirement |       |
|---------------------------------------------|-----------------|--------|------------|-------|
| Gradation (% passing by weight) Sieve size: |                 | 3/8"   | 5/16"      | 1/4"  |
| 3/4"                                        |                 |        |            |       |
| 1/2"                                        |                 | 100    |            |       |
| 3/8"                                        | California Test | 85–100 | 100        | 100   |
| No. 4                                       | 202             | 0–15   | 0–50       | 60–85 |
| No. 8                                       |                 | 0–5    | 0–15       | 0–25  |
| No. 16                                      |                 |        | 0–5        | 0–5   |
| No. 30                                      |                 |        | 0–3        | 0–3   |
| No. 200                                     |                 | 0–2    | 0–2        | 0–2   |

#### Asphaltic Emulsion Chip Seal Aggregate Gradation

#### 37-2.02C Construction

#### 37-2.02C(1) General

Reserved

#### 37-2.02C(2) Asphaltic Emulsions

Asphaltic emulsions must be applied within the application rate ranges shown in the following table:

| Asphallic Emulsion Application Rates |                        |  |
|--------------------------------------|------------------------|--|
| Aggregate gradation                  | Application rate range |  |
|                                      | (gal/sq yd)            |  |
| 3/8"                                 | 0.30–0.45              |  |
| 5/16"                                | 0.25–0.35              |  |
| 1/4"                                 | 0.20–0.30              |  |

# Asphaltic Emulsion Application Rates

For double asphaltic emulsion chip seals, the asphaltic emulsions must be applied within the application rates shown in the following table:

| Asphaltic Emulsion Application Rates |                        |  |
|--------------------------------------|------------------------|--|
| Double chip seals                    | Application rate range |  |
|                                      | (gal/sq yd)            |  |
| 1st application                      | 0.30–0.45              |  |
| 2nd application                      | 0.20-0.30              |  |

# Asphaltic Emulsion Application Rates

When applied, the temperature of the asphaltic emulsions must be from 130 to 180 degrees F.

Apply asphaltic emulsions when the ambient air temperature is from 65 to 110 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

#### 37-2.02C(3) Spreading Aggregates

Aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate Spread Rates |                   |  |
|------------------------|-------------------|--|
| Aggregate gradation    | Spread rate range |  |
|                        | (lb/sq yd)        |  |
| 3/8"                   | 20–30             |  |
| 5/16"                  | 16–25             |  |
| 1/4"                   | 12–20             |  |

For double asphaltic emulsion chip seals, aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate Spread Rates |                   |  |
|------------------------|-------------------|--|
| Double chip seal       | Spread rate range |  |
| -                      | (lb/sq yd)        |  |
| 1st application        | 23–30             |  |
| 2nd application        | 12–20             |  |

#### Aggregate Spread Dates

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for asphaltic emulsion chip seals if you prevent contamination. Aggregate must have a damp surface at spreading. If water visibly separates from the aggregate, do not spread. You may re-dampen aggregate in the delivery vehicle.

Spread aggregate before an asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

#### 37-2.02D Payment

Not Used

#### 37-2.03 POLYMER MODIFIED ASPHALTIC EMULSION CHIP SEALS

#### 37-2.03A General

#### 37-2.03A(1) Summary

Section 37-2.03 includes specifications for applying polymer modified asphaltic emulsion chip seals. A polymer modified asphaltic emulsion chip seal includes applying a polymer modified asphaltic emulsion, followed by aggregate, and then a flush coat.

A double polymer modified asphaltic emulsion chip seal is the application of a polymer modified asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

#### 37-2.03A(2) Definitions

Reserved

#### 37-2.03A(3) Submittals

Immediately after sampling, submit two 1-quart cans of polymer modified asphaltic emulsion taken in the presence of the Engineer. A sample must be submitted in an insulated shipping container.

37-2.03A(4) Quality Assurance

37-2.03A(4)(a) General

Reserved

37-2.03A(4)(b) Quality Control

37-2.03A(4)(b)(i) General

Reserved

#### 37-2.03A(4)(b)(ii) Polymer Modified Asphaltic Emulsions

Circulate polymer modified asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples for acceptance testing.

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| Quality characteristic                           | Test method         | Minimum<br>sampling and<br>testing<br>frequency | Sampling<br>location |  |
|--------------------------------------------------|---------------------|-------------------------------------------------|----------------------|--|
| Saybolt Furol Viscosity, at 50 °C (Saybolt Furol |                     |                                                 |                      |  |
| seconds)                                         |                     |                                                 |                      |  |
| Settlement, 5 days (max, %)                      | ]                   |                                                 |                      |  |
| Storage stability test, 1 day (max, %)           | AASHTO T 59         | Minimum 1                                       | Dictributor          |  |
| Sieve test (max, %)                              |                     | per day per                                     | truck                |  |
| Demulsibility (min, %)                           |                     | delivery truck                                  |                      |  |
| Particle charge                                  |                     |                                                 |                      |  |
| Ash content (max, %)                             | ASTM D3723          |                                                 |                      |  |
| Residue by evaporation (min, %)                  | California Test 331 |                                                 |                      |  |
| Tests on residue from evaporation test:          |                     |                                                 |                      |  |
| Penetration, 25 °C                               | AASHTO T 49         |                                                 |                      |  |
| Penetration, 4 °C, 200g for 60 seconds           | AASHTO T 49         | Minimum 1                                       | Dictributor          |  |
| Ductility, 25 °C (min, mm)                       | AASHTO T 51         | per day per                                     |                      |  |
| Torsional recovery (min, %)                      | California Test 332 | delivery truck                                  |                      |  |
| Ring and Ball Softening Point (min, °F)          | AASHTO T 53         |                                                 |                      |  |

#### Polymer Modified Asphaltic Emulsion

#### 37-2.03A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                         | Test method            | R      | equirement |       |
|------------------------------------------------|------------------------|--------|------------|-------|
| Gradation (% passing by weight)<br>Sieve size: |                        | 3/8"   | 5/16"      | 1/4"  |
| 3/4"                                           |                        |        |            |       |
| 1/2"                                           | California Test<br>202 | 100    |            |       |
| 3/8"                                           |                        | 85–100 | 100        | 100   |
| No. 4                                          |                        | 0–15   | 0–50       | 60–85 |
| No. 8                                          |                        | 0–5    | 0–15       | 0–25  |
| No. 16                                         |                        |        | 0–5        | 0–5   |
| No. 30                                         |                        |        | 0–3        | 0–3   |
| No. 200                                        |                        | 0–2    | 0–2        | 0–2   |

#### 37-2.03B Materials

#### 37-2.03B(1) General

Reserved

#### 37-2.03B(2) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must include elastomeric polymer.

A polymer modified asphaltic emulsion must be Grade PMRS2, PMRS2h, PMCRS2, or PMCRS2h. Polymer content in percent by weight does not apply.

A polymer modified asphaltic emulsion must comply with section 94 and the quality characteristic requirements in the following table:

| Polymeric Asphaltic Emulsion                 |             |             |  |  |
|----------------------------------------------|-------------|-------------|--|--|
| Quality characteristic                       | Test method | Requirement |  |  |
| Penetration, 4 °C, 200g for 60 seconds (min) | AASHTO T 49 | 6           |  |  |
| Ring and Ball Softening Point (min, °F)      | AASHTO T 53 | 135         |  |  |

#### 37-2.03B(3) Aggregate

The aggregate gradation for a polymer modified asphaltic emulsion chip seal must comply with the requirements shown in the following table:

| Quality characteristic                           | Test method            | Requirement |       |       |  |
|--------------------------------------------------|------------------------|-------------|-------|-------|--|
| Gradation (% passing<br>by weight)<br>Sieve Size |                        | 3/8"        | 5/16" | 1/4"  |  |
| 3/4"                                             |                        |             |       |       |  |
| 1/2"                                             | California Test<br>202 | 100         |       |       |  |
| 3/8"                                             |                        | 85–100      | 100   | 100   |  |
| No. 4                                            |                        | 0–15        | 0–50  | 60–85 |  |
| No. 8                                            |                        | 0–5         | 0–15  | 0–25  |  |
| No. 16                                           |                        |             | 0–5   | 0–5   |  |
| No. 30                                           |                        |             | 0–3   | 0–3   |  |
| No. 200                                          |                        | 0–2         | 0–2   | 0–2   |  |

## Asphaltic Emulsion Chip Seal Aggregate Gradation

#### 37-2.03C Construction

Polymer modified asphaltic emulsions must be applied within the application rate ranges shown in the following table:

| Forymer mouned Asphanic Emulsion Application Rates |                        |  |
|----------------------------------------------------|------------------------|--|
| Aggregate gradation                                | Application rate range |  |
|                                                    | (gal/sq yd)            |  |
| 3/8"                                               | 0.30–0.45              |  |
| 5/16"                                              | 0.25–0.35              |  |
| 1/4"                                               | 0.20–0.30              |  |
|                                                    |                        |  |

#### **Polymer Modified Asphaltic Emulsion Application Rates**

For double polymer modified asphaltic emulsion chip seals, polymer modified asphaltic emulsions must be applied within the application rates shown in the following table:

#### Polymer Modified Asphaltic Emulsion Application Rates

| Double application | Application rate range<br>(gal/sq yd) |  |
|--------------------|---------------------------------------|--|
| 1st application    | 0.30–0.45                             |  |
| 2nd application    | 0.20-0.30                             |  |

Apply polymer modified asphaltic emulsions when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply polymer modified asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

Aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate Spread Rates |                   |  |  |
|------------------------|-------------------|--|--|
| Chip seal type         | Spread rate range |  |  |
|                        | (lb/sq yd)        |  |  |
| 3/8"                   | 20–30             |  |  |
| 5/16"                  | 16–25             |  |  |
| 1/4"                   | 12–20             |  |  |

For double chip seals, aggregate must be spread within spread rate ranges shown in the following table:

| Aggregate Spread Rates |                   |  |  |
|------------------------|-------------------|--|--|
| Double application     | Spread rate range |  |  |
|                        | (lb/sq yd)        |  |  |
| 1st application        | 23–30             |  |  |
| 2nd application        | 12–20             |  |  |

#### Aggregate Spread Rates

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for the polymer modified asphaltic emulsion chip seals if you prevent contamination. Aggregate must have damp surfaces at spreading. If water visibly separates from the aggregate, do not spread. You may redampen aggregate in the delivery vehicle.

Spread aggregate before the polymer modified asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

#### 37-2.03D Payment

Not Used

#### 37-2.04 ASPHALT RUBBER BINDER CHIP SEALS

#### 37-2.04A General

#### 37-2.04A(1) Summary

Section 37-2.04 includes specifications for applying asphalt rubber binder chip seals.

An asphalt rubber binder chip seal consists of applying asphalt rubber binder followed by heated aggregate precoated with asphalt binder followed by a flush coat.

#### 37-2.04A(2) Definitions

- **crumb rubber modifier:** Combination of ground or granulated high natural scrap tire crumb rubber and scrap tire crumb rubber derived from waste tires described in Pub Res Code § 42703.
- **descending viscosity reading:** Subsequent viscosity reading at least 5 percent lower than the previous viscosity reading.

high natural scrap tire crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of vehicle tires or tire buffing.

#### 37-2.04A(3) Submittals

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder field blending equipment and application equipment. If an air quality permit is not required by the local air district for producing asphalt rubber binder, submit verification from the local air district that an air quality permit is not required.

For each delivery of asphalt rubber binder ingredients to the job site, submit a certificate of compliance with a copy of the specified test results.

Submit a certified volume or weight slip for each delivery of asphalt rubber binder ingredients and asphalt rubber binder.

Submit a SDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

- 1. Samples of each asphalt rubber binder ingredient:
  - 1.1. 2 lbs of scrap tire crumb rubber
  - 1.2. 2 lbs of high natural scrap tire crumb rubber
  - 1.3. Two 1-quart cans of base asphalt binder
  - 1.4. Two 1-quart cans of asphalt modifier
- 2. Asphalt rubber binder formulation and data as follows:
  - 2.1. For asphalt modifier, include:
    - 2.1.1. Source of asphalt modifier
    - 2.1.2. Type of asphalt modifier
    - 2.1.3. Percentage of asphalt modifier by weight of asphalt binder
    - 2.1.4. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
    - 2.1.5. Test results for the specified quality characteristics
  - 2.2. For crumb rubber modifier, include:
    - 2.2.1. Each source and type of scrap tire crumb rubber and high natural scrap tire crumb rubber
    - 2.2.2. Percentage of scrap tire crumb rubber and high natural scrap tire crumb rubber by total weight of asphalt rubber binder
    - 2.2.3. Test results for the specified quality characteristics
  - 2.3. For asphalt rubber binder, include minimum reaction time and temperature

Immediately after sampling, submit five 1-quart cans of asphalt rubber binder taken in the presence of the Engineer. Sample must be submitted in insulated shipping containers.

Submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

Submit the log of asphalt rubber binder descending viscosity test results within 1 business day after sampling.

Submit asphalt rubber binder quality control viscosity test results within 1 business day after sampling.

#### 37-2.04A(4) Quality Assurance

#### 37-2.04A(4)(a) General

The equipment used in producing asphalt rubber binder and the equipment used in spreading asphalt rubber binder must be permitted for use or exempted by the local air district.

#### 37-2.04A(4)(b) Quality Control

37-2.04A(4)(b)(i) General

Reserved

#### 37-2.04A(4)(b)(ii) Asphalt Modifiers

For asphalt modifiers, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

#### Asphalt Modifier for Asphalt Rubber Binder

| Quality characteristic | Test method | Frequency      |  |
|------------------------|-------------|----------------|--|
| Viscosity              | ASTM D445   | 1 per shipment |  |
| Flash point            | ASTM D92    |                |  |
| Molecular Analysis:    |             |                |  |
| Asphaltenes            | ASTM D2007  | 1 per shipment |  |
| Aromatics              | ASTM D2007  |                |  |

#### 37-2.04A(4)(b)(iii) Crumb Rubber Modifiers

Sample and test scrap tire crumb rubber and high natural scrap tire crumb rubber separately.

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

| Crumb Rubber Modifier                                          |                     |                 |  |
|----------------------------------------------------------------|---------------------|-----------------|--|
| Quality characteristic                                         | Test method         | Frequency       |  |
| Scrap tire crumb rubber gradation                              | California Test 385 | 1 per 10,000    |  |
| High natural scrap tire crumb rubber gradation                 | California Test 385 | 1 per 3,400 lb  |  |
| Wire in CRM                                                    | California Test 385 |                 |  |
| Fabric in CRM                                                  | California Test 385 | 1 por 10 000 lb |  |
| CRM particle length                                            |                     |                 |  |
| CRM specific gravity                                           | California Test 208 |                 |  |
| Natural rubber content in high natural scrap tire crumb rubber | ASTM D297           | 1 per 3,400 lb  |  |

#### 37-2.04A(4)(b)(iv) Asphalt Rubber Binders

For asphalt rubber binders, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| <b>P</b>                                                               |             |                    |                                               |
|------------------------------------------------------------------------|-------------|--------------------|-----------------------------------------------|
| Quality characteristic                                                 | Test method | Sampling location  | Frequency                                     |
| Descending viscosity <sup>a</sup> at 375 °F (Pa•s x 10 <sup>-3</sup> ) | ASTM D7741  | Reaction vessel    | 1 per lot <sup>b</sup>                        |
| Viscosity at 375 °F (Pa•s x 10 <sup>-3</sup> )                         | ASTM D7741  | Distribution truck | 15 minutes before<br>use per lot <sup>b</sup> |
| Cone penetration at 25 °C (0.10 mm)                                    | ASTM D217   |                    |                                               |
| Resilience at 25 °C (% rebound)                                        | ASTM D5329  | Distribution truck | 1 per lot <sup>b</sup>                        |
| Softening point (°C)                                                   | ASTM D36    |                    |                                               |

#### Asphalt Rubber Binder Quality Control Requirements

<sup>a</sup>Start taking viscosity readings at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 30 minutes until 2 consecutive descending viscosity readings have been obtained and the final viscosity complies with the specification requirement. <sup>b</sup>A lot is defined in the *MPQP*.

Retain samples from each lot. Test samples for cone penetration, resilience, and softening point for the first 3 lots and if all 3 lots pass, the testing frequency may be reduced to once for every 3 lots.

If QC test results indicate that the asphalt rubber binder does not comply with the specifications, take corrective action and notify the Engineer.

#### 37-2.04A(4)(c) Department Acceptance

#### 37-2.04A(4)(c)(i) General

Reserved

#### 37-2.04A(4)(c)(ii) Asphalt Modifiers

The Department accepts asphalt modifier based on compliance with the requirements shown in the following table:

| Test method | Requirement                                                      |  |  |  |
|-------------|------------------------------------------------------------------|--|--|--|
| ASTM D445   | $X \pm 3^{a}$                                                    |  |  |  |
| ASTM D92    | 207                                                              |  |  |  |
|             |                                                                  |  |  |  |
| ASTM D2007  | 0.1                                                              |  |  |  |
| ASTM D2007  | 55                                                               |  |  |  |
|             | Test method<br>ASTM D445<br>ASTM D92<br>ASTM D2007<br>ASTM D2007 |  |  |  |

#### Asphalt Modifier for Asphalt Rubber Binder

<sup>a</sup>The symbol "X" is the asphalt modifier viscosity.

#### 37-2.04A(4)(c)(iii) Crumb Rubber Modifiers

Scrap tire CRM and high natural CRM are sampled and tested separately.

The Department accepts scrap tire CRM and high natural CRM based on compliance with the requirements shown in the following table:

| Quality characteristic                         | Test method         | Requirement |  |  |
|------------------------------------------------|---------------------|-------------|--|--|
| Wire in CRM (max, %)                           | California Test 385 | 0.01        |  |  |
| Fabric in CRM (max, %)                         | California Test 385 | 0.05        |  |  |
| CRM particle length (max, in)                  |                     | 3/16        |  |  |
| CRM specific gravity                           | California Test 208 | 1.1–1.2     |  |  |
| Natural rubber content in high natural CRM (%) | ASTM D297           | 40.0–48.0   |  |  |

Crumb Rubber Modifier for Asphalt Rubber Binder

The Department accepts CRM gradation based on the requirements shown in the following table:

Test Requirement Quality characteristic method Gradation (% passing by weight) Scrap tire crumb rubber High natural scrap tire Sieve size: crumb rubber Contract Operating Contract Operating range compliance range compliance 100 100 No. 8 --California No. 10 95-100 90-100 100 100 Test 385 No. 16 35-85 32-88 92-100 85-100 No. 30 2–25 1–30 25–95 20–98 No. 50 0–10 0–15 6–35 2 - 40No. 100 0–5 0–10 0–7 0–10 No. 200 0–2 0–5 0–3 0–5

#### **Crumb Rubber Modifier Gradation Requirements**

If a test result for CRM gradation does not comply with the specifications, the Department deducts the corresponding amount for each gradation test as shown in the following table:

| Material                             | Gradation test result <sup>a</sup>         | Deduction |
|--------------------------------------|--------------------------------------------|-----------|
| Scrap tire crumb rubber              | Operating range < TR < Contract compliance | \$250     |
| Scrap tire crumb rubber              | TR > Contract compliance                   | \$1,100   |
| High natural scrap tire crumb rubber | Operating range < TR < Contract compliance | \$250     |
| High natural scrap tire crumb rubber | TR > Contract compliance                   | \$600     |

<sup>a</sup>Test Result = TR

Each gradation test for scrap tire crumb rubber represents 10,000 lb or the quantity used in that day's production, whichever is less.

Each gradation test for high natural scrap tire crumb rubber represents 3,400 lb or the quantity used in that day's production, whichever is less.

#### 37-2.04A(4)(c)(iv) Asphalt Rubber Binders

For Department acceptance testing, take a sample of asphalt rubber binder in the Engineer's presence every 5 lots or once a day, whichever is greater. Each sample must be in five 1-quart cans with an open top and friction lid.

For an asphalt rubber binder, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                                      | Test method | Requirement |  |  |
|-------------------------------------------------------------|-------------|-------------|--|--|
| Cone penetration at 25 °C (0.10 mm)                         | ASTM D217   | 25–60       |  |  |
| Resilience at 25 °C (% rebound)                             | ASTM D5329  | 18–50       |  |  |
| Softening point (°C)                                        | ASTM D36    | 55–88       |  |  |
| Viscosity at 375 °F (Pa•s x 10 <sup>-3</sup> ) <sup>a</sup> | ASTM D7741  | 1,500–2,500 |  |  |
|                                                             |             |             |  |  |

#### Asphalt Rubber Binder

<sup>a</sup>Prepare sample for viscosity test under California Test 388.

#### 37-2.04A(4)(c)(v) Precoated Aggregate

The Department accepts precoated aggregate based on compliance with the requirements shown in the following table:

| Quality Characteristic               | Test method         | Requirement |
|--------------------------------------|---------------------|-------------|
| 1/2" gradation (% passing by weight) | California Test 202 |             |
| Sieve size:                          |                     |             |
| 3/4"                                 |                     | 100         |
| 1/2"                                 |                     | 85–90       |
| 3/8"                                 |                     | 0–30        |
| No. 4                                |                     | 0–5         |
| No. 8                                |                     |             |
| No. 200                              |                     | 0-1         |
| 3/8" gradation (% passing by weight) | California Test 202 |             |
| Sieve size:                          |                     |             |
| 3/4"                                 |                     | 100         |
| 1/2"                                 |                     | 95–100      |
| 3/8"                                 |                     | 70–85       |
| No. 4                                |                     | 0–15        |
| No. 8                                |                     | 0-5         |
| No. 200                              |                     | 0-1         |

#### Precoated Aggregate Gradation Acceptance Criteria

#### 37-2.04B Materials

#### 37-2.04B(1) General

Reserved

#### 37-2.04B(2) Asphalt Binders

Asphalt binder used as the base binder for asphalt rubber binder must comply with the specifications for asphalt binder. Do not modify asphalt binder with polymer.

#### 37-2.04B(3) Asphalt Modifiers

An asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. An asphalt modifier must comply with the requirements shown in the following table:

| Quality characteristic Test method Requirement              |            |               |  |  |  |
|-------------------------------------------------------------|------------|---------------|--|--|--|
| Viscosity at 100 °C (m <sup>2</sup> /s x 10 <sup>-6</sup> ) | ASTM D445  | $X \pm 3^{a}$ |  |  |  |
| Flash point (min, CL.O.C., °C)                              | ASTM D92   | 207           |  |  |  |
| Molecular analysis:                                         |            |               |  |  |  |
| Asphaltenes by mass (max, %)                                | ASTM D2007 | 0.1           |  |  |  |
| Aromatics by mass (min, %)                                  | ASTM D2007 | 55            |  |  |  |

#### Asphalt Modifier for Asphalt Rubber Binder

<sup>a</sup>X denotes the proposed asphalt modifier viscosity from 19 to 36. A change in X requires a new asphalt rubber binder submittal.

# 37-2.04B(4) Crumb Rubber Modifiers

The CRM to be used must be on the Authorized Materials List for crumb rubber modifier.

The CRM must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural scrap tire crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, it must occur before grinding and granulating. Cryogenically-produced CRM particles must be large enough to be ground or granulated.

The CRM must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of CRM may be added. The CRM must not cause foaming when combined with the asphalt binder and asphalt modifier.

The CRM must comply with the requirements shown in the following table:

| Quality characteristic        | Test method         | Requirement |  |  |
|-------------------------------|---------------------|-------------|--|--|
| Wire in CRM (max, %)          | California Test 385 | 0.01        |  |  |
| Fabric in CRM (max, %)        | California Test 385 | 0.05        |  |  |
| CRM particle length (max, in) |                     | 3/16        |  |  |
| CRM specific gravity          | California Test 208 | 1.1–1.2     |  |  |

Crumb Rubber Modifier for Asphalt Rubber Binder

The CRM must comply with the requirements shown in the following table:

Crumb Rubber Modifier Requirements

|                             |             | Requirement             |                         |  |
|-----------------------------|-------------|-------------------------|-------------------------|--|
| Quality characteristic      | Test method | Scrap tire crumb rubber | High natural scrap tire |  |
|                             |             |                         | crumb rubber            |  |
| Acetone extract (%)         |             | 6.0–16.0                | 4.0–16.0                |  |
| Rubber hydrocarbon (min, %) |             | 42.0–65.0               | 50.0                    |  |
| Natural rubber content (%)  | ASTM D297   | 22.0–39.0               | 40.0–48.0               |  |
| Carbon black content (%)    |             | 28.0–38.0               |                         |  |
| Ash content (max, %)        |             | 8.0                     |                         |  |

Scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

| Quality characteristic  | Test       | Requirement     |                 |            |
|-------------------------|------------|-----------------|-----------------|------------|
|                         | method     |                 |                 |            |
| Gradation (% passing by |            | Gradation limit | Operating range | Contract   |
| weight)                 |            |                 |                 | compliance |
| Sieve size:             |            |                 |                 | -          |
| No. 8                   |            | 100             | 100             | 100        |
| No. 10                  | California | 98–100          | 95–100          | 90–100     |
| No. 16                  | Test 385   | 45–75           | 35–85           | 32–88      |
| No. 30                  |            | 2–20            | 2–25            | 1–30       |
| No. 50                  |            | 0–6             | 0–10            | 0–15       |
| No. 100                 |            | 0–2             | 0–5             | 0–10       |
| No. 200                 |            | 0               | 0–2             | 0–5        |

#### Scrap Tire Crumb Rubber Gradation

High natural scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

| Hig                     | High Natural Scrap Tire Crumb Rubber Gradation |                 |                 |            |  |
|-------------------------|------------------------------------------------|-----------------|-----------------|------------|--|
| Quality characteristic  | Test                                           |                 | Requirement     |            |  |
|                         | method                                         |                 |                 |            |  |
| Gradation (% passing by |                                                | Gradation limit | Operating range | Contract   |  |
| weight)                 |                                                |                 |                 | compliance |  |
| Sieve size:             |                                                |                 |                 |            |  |
| No. 10                  | Colifornia                                     | 100             | 100             | 100        |  |
| No. 16                  |                                                | 95–100          | 92–100          | 85–100     |  |
| No. 30                  | 1651 365                                       | 35–85           | 25–95           | 20–98      |  |
| No. 50                  |                                                | 10–30           | 6–35            | 2–40       |  |
| No. 100                 |                                                | 0–4             | 0–7             | 0–10       |  |
| No. 200                 |                                                | 0–1             | 0–3             | 0–5        |  |

# High Natural Scrap Tire Crumb Rubber Gradation

#### 37-2.04B(5) Asphalt Rubber Binders

An asphalt rubber binder must be a combination of:

- 1. Asphalt binder
- 2. Asphalt modifier
- 3. Crumb rubber modifier

Asphalt rubber binder blending equipment must be authorized under the Department's MPQP.

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

An asphalt rubber binder must be  $79 \pm 1$  percent by weight asphalt binder and  $21 \pm 1$  percent by weight of CRM. The minimum percentage of CRM must be 20.0 percent and lower values must not be rounded up.

The CRM must be 75  $\pm$  2 percent by weight scrap tire crumb rubber and 25  $\pm$  2 percent by weight high natural scrap tire crumb rubber.

An asphalt modifier and asphalt binder must be blended at the production site. An asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder supplier determines the exact percentage.

If blended before adding CRM, the asphalt binder must be from 375 to 440 degrees F when an asphalt modifier is added and the mixture must circulate for at least 20 minutes. An asphalt binder, asphalt modifier, and CRM may be proportioned and combined simultaneously.

The blend of an asphalt binder and an asphalt modifier must be combined with the CRM at the asphalt rubber binder production site. The asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when the CRM is added. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must comply with the requirements shown in the following table:

| Quality characteristic                                      | Test method | Requirement |
|-------------------------------------------------------------|-------------|-------------|
| Cone penetration at 25 °C (0.10 mm)                         | ASTM D217   | 25–60       |
| Resilience at 25 °C (% rebound)                             | ASTM D5329  | 18–50       |
| Softening point (°C)                                        | ASTM D36    | 55–88       |
| Viscosity at 375 °F (Pa•s x 10 <sup>-3</sup> ) <sup>a</sup> | ASTM D7741  | 1,500–2,500 |

#### Asphalt Rubber Binder

<sup>a</sup>Prepare sample for viscosity test under California Test 388.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after the 45-minute reaction period. Reheating asphalt rubber binder that cools below 375 degrees F is a reheat cycle. Do not exceed 2 reheat cycles. If reheating, the asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add CRM. The CRM must not exceed 10 percent by weight of the asphalt rubber binder. Allow added CRM to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

#### 37-2.04B(6) Precoated Aggregate

Before precoating with asphalt binder, aggregate for an asphalt rubber binder chip seal must comply with the gradation requirements shown in the following table:

| Quality characteristic                         | Test method     | Requi | rement |
|------------------------------------------------|-----------------|-------|--------|
| Gradation (% passing by weight)<br>Sieve size: | California Test | 1/2"  | 3/8"   |
| 3/4"                                           |                 | 100   | 100    |
| 1/2"                                           |                 | 85–90 | 95–100 |
| 3/8"                                           | 202             | 0–30  | 70–85  |
| No. 4                                          |                 | 0–5   | 0–15   |
| No. 8                                          |                 |       | 0–5    |
| No. 200                                        |                 | 0–1   | 0–1    |

#### Asphalt Rubber Binder Chip Seal Aggregate Gradation

### 37-2.04C Construction

#### 37-2.04C(1) General

Reserved

#### 37-2.04C(2) Equipment

Distributor trucks must be equipped with:

- 1. Mixing and heating unit
- 2. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed

#### 37-2.04C(3) Asphalt Rubber Binder Application

Apply the asphalt rubber binder when the ambient temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply the asphalt rubber binder unless enough aggregate is available at the job site to cover the asphalt rubber binder within 2 minutes. Intersections, turn lanes, gore points, and irregular areas must be covered within 15 minutes.

Do not apply asphalt rubber binder when pavement is damp or during high wind conditions. If authorized, you may adjust the distributor bar height and distribution speed and use shielding equipment during high wind conditions.

When applied, the temperature of the asphalt rubber binder must be from 385 to 415 degrees F.

Apply the asphalt rubber binder at a rate from 0.55 to 0.65 gal/sq yd. You may reduce the application rate by 0.050 gal/sq yd in the wheel paths.

#### 37-2.04C(4) Precoated Aggregate Spreading

Spread aggregate at a rate from 28 to 40 lb/sq yd. Do not spread aggregate more than 200 feet ahead of the completed initial rolling.

#### 37-2.04C(5) Rolling and Sweeping

Perform initial rolling within 90 seconds of spreading aggregate. If authorized for final rolling, you may use a steel-wheeled roller weighing from 8 to 10 tons in static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge aggregate.

#### 37-2.04D Payment

Asphalt rubber binder is measured as specified for asphalt binder.

#### 37-2.05 STRESS ABSORBING MEMBRANE INTERLAYERS

#### 37-2.05A General

Section 37-2.05 includes specifications for placing stress absorbing membrane interlayers (SAMI).

Comply with section 37-2.04 except a flush coat is not required.

Traffic must not be allowed on a SAMI.

#### 37-2.05B Materials

For a SAMI, aggregate must comply with the 3/8-inch gradation.

#### 37-2.05C Construction

If a SAMI is overlaid in the same work shift, section 37-2.01C(4)(e) does not apply.

Final sweeping is not required for a SAMI.

#### 37-2.05D Payment

Not Used

#### 37-2.06 MODIFIED ASPHALT BINDER CHIP SEALS

Reserved

37-2.07 SCRUB SEALS

Reserved

#### 37-3 SLURRY SEALS AND MICRO-SURFACINGS

#### 37-3.01 GENERAL

#### 37-3.01A General

#### 37-3.01A(1) Summary

Section 37-3.01 includes general specifications for applying slurry seals and micro-surfacings.

#### 37-3.01A(2) Definitions

Reserved

#### 37-3.01A(3) Submittals

At least 15 days before starting placement of a slurry seal or micro-surfacing, submit:

- 1. Samples for:
  - 1.1. Asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
  - 1.2 Polymer modified asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
  - 1.3. Micro-surfacing, two 1-quart wide mouth plastic containers with screw top lid of micro-surfacing emulsion
- Asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion data as follows:
  - 2.1. Supplier and Type/Grade of asphaltic emulsion
  - 2.2. Type of modifier polymer for polymer modified asphaltic emulsion or micro-surfacing emulsion
  - 2.3. Copy of the specified test results for asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion
- 3. 50 lb of aggregate
- 4. Aggregate test results for the followings:
  - 4.1. Gradation
  - 4.2. Los Angeles Rattler
  - 4.3. Percent of crushed particles
- 4.4 Sand equivalent
- 4.5 Durability

At least 10 days before starting placement of a slurry seal or micro-surfacing, submit a laboratory report of test results and the proposed mix design from an authorized laboratory. The authorized laboratory must sign the laboratory report and mix design.

The report must include:

- 1. Test results used in the mix design compared with specification requirements
- 2. Proportions based on the dry weight of aggregate, including ranges, for:
  - 2.1. Aggregate
  - 2.2. Water
  - 2.3. Additives
  - 2.4. Mineral filler
  - 2.5. Slurry seal emulsion or micro-surfacing emulsion residual asphalt content
- Recommended changes to the proportions based on heating the mixture to 100 degrees F and mixing for 60 seconds, if atmospheric temperatures during application will be 90 degrees F or above, for:
  - 3.1. Water
  - 3.2. Additives
  - 3.3. Mineral filler
- 4. Quantitative moisture effects on the aggregate's unit weight determined under ASTM C29M

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you change any of the materials in the mix design, submit a new mix design and laboratory report at least 10 days before starting slurry seal or micro-surfacing work.

Submit a certificate of compliance as specified for asphaltic emulsion in section 94-1.01C with each shipment of asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

| Quality characteristic                | Maximum reporting time |
|---------------------------------------|------------------------|
|                                       | allowance              |
| Los Angeles Rattler loss (max, %)     | 2 business days        |
| Percent of crushed particles (min, %) | 2 business days        |
| Durability (min)                      | 2 business days        |
| Resistance of fine aggregate to       |                        |
| degradation by abrasion in the Micro- | 2 business days        |
| Deval Apparatus (% loss by weight)    |                        |
| Gradation (% passing by weight)       | 48 hours               |
| Sand equivalent (min)                 | 48 hours               |
| Moisture content (%)                  | 48 hours               |

#### **Quality Control Test Reporting Requirements**

Within 3 days after taking asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion quality control samples, submit the authorized laboratory's test results.

#### 37-3.01A(4) Quality Assurance

#### 37-3.01A(4)(a) General

Your authorized laboratory must be able to perform International Slurry Surfacing Association tests and mix design.

## 37-3.01A(4)(b) Quality Control

37-3.01A(4)(b)(i) General

#### Reserved

#### 37-3.01A(4)(b)(ii) Aggregate

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

| Ouglity aboractoristic                 |                           |                   | Leastion of    |
|----------------------------------------|---------------------------|-------------------|----------------|
|                                        | l rest method             | Iviinimum         | Location of    |
|                                        |                           | sampling and      | sampling       |
|                                        |                           | testing frequency |                |
| Los Angeles Dettler loss (may 9()      |                           | 1 ot doy of       | See Celifernia |
| LOS Angeles Rattier loss (max, %)      | California Test 211       | ist day of        | See California |
| At 500 revolutions                     |                           | production        | Test 125       |
| Percent of crushed particles (min, %)  | AASHTO T 335              | 1st day of        | See California |
|                                        |                           | production        | Test 125       |
| Sand equivalent (min)                  | California Test 217       | 1 per working     | See California |
|                                        |                           | stockpile per day | Test 125       |
| Resistance of fine aggregate to        | ASTM D7428                |                   |                |
| degradation by abrasion in             |                           | 1 per working     | See California |
| the Micro-Deval Apparatus (% loss      |                           | stockpile per day | Test 125       |
| by weight)                             |                           |                   | 1001120        |
|                                        |                           |                   |                |
| Gradation (% passing by weight)        | California Test 202       | 1 per working     | See California |
|                                        |                           | stockpile per day | Test 125       |
| Moisture content, from field stockpile | AASHTO T 255 <sup>a</sup> | 1 per working     | See California |
| (%)                                    |                           | stockpile per day | Test 125       |

#### Aggregate Quality Control

<sup>a</sup>Test aggregate moisture at field stockpile every 2 hours if you are unable to maintain the moisture content to within a maximum daily variation of  $\pm 0.5$  percent.

#### 37-3.01A(4)(b)(iii) Slurry Seals and Micro-surfacings

Reserved

#### 37-3.01A(4)(c) Department Acceptance

Slurry Seal and micro-surfacing acceptance is based on:

- 1. Visual inspection for the following:
  - 1.1. Uniform surface texture throughout the work limits.
  - 1.2. Marks in the surface:
    - 1.2.1. Up to 4 marks in the completed slurry seal or micro-surfacing surface that are up to 1 inch wide and up to 6 inches long per 1000 square feet of slurry seal or micro-surfacing placed.
    - 1.2.2. No marks in the completed slurry seal or micro-surfacing surface that are over 1 inch wide or 6 inches long.
  - 1.3. Excessive raveling consisting of the separation of the aggregate from the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.
  - 1.4. Bleeding consists of the occurrence of a film of asphaltic material on the surface of the slurry seal or micro-surfacing.
  - 1.5. Delaminating of slurry seal or micro-surfacing from the existing pavement.
  - 1.6. Rutting or wash-boarding.
- 2. Department's sampling and testing for compliance with the requirements for aggregate shown in the following table:

|                                                | •               |        |           |          |
|------------------------------------------------|-----------------|--------|-----------|----------|
| Quality characteristic                         | Test method     | R      | equiremen | ts       |
| Gradation (% passing by weight)<br>Sieve Size: |                 | Type I | Type II   | Type III |
| 3/8"                                           |                 |        | 100       | 100      |
| No. 4                                          | California Test | 100    | 94–100    | 70–90    |
| No. 8                                          | 202             | 90–100 | 65–90     | 45–70    |
| No. 16                                         |                 | 60–90  | 40–70     | 28–50    |
| No. 30                                         |                 | 40–65  | 25–50     | 19–34    |
| No. 200                                        |                 | 10–20  | 5–15      | 5–15     |

#### Aggregate Gradation Acceptance Criteria

An aggregate gradation test represents 300 tons or 1 day's production, whichever is less.

If test results for aggregate gradation do not comply with the specifications, you may remove the slurry seal or micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts:

- 1. \$1.75 per ton of slurry seal for each noncompliant aggregate gradation
- 2. \$2.00 per ton of micro-surfacing for each noncompliant aggregate gradation

#### 37-3.01B Materials

#### 37-3.01B(1) General

Additional water must not cause separation of the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion from the aggregate before placement.

You may use an additive that does not adversely affect the slurry seal or micro-surfacing.

#### 37-3.01B(2) Aggregate

Aggregate must be rock dust. Aggregate must be free from vegetable matter, deleterious substances, caked or clay lumps, and oversized particles.

Aggregate for a slurry seal and micro-surfacing must comply with the gradations shown in the following table:

| Quality charac | teristic     | Test method    |      | Requi      | rements |         |          |
|----------------|--------------|----------------|------|------------|---------|---------|----------|
|                | Gradation (% | passing by wei | ght) |            | Type I  | Type II | Type III |
|                | Sieve size:  |                |      |            |         |         |          |
|                | 3/8"         |                |      |            |         | 100     | 100      |
|                | No. 4        |                |      | California | 100     | 94–100  | 70–90    |
|                | No. 8        |                |      | Test 202   | 90–100  | 65–90   | 45–70    |
|                | No. 16       |                |      |            | 60–90   | 40–70   | 28–50    |
|                | No. 30       |                |      |            | 40–65   | 25–50   | 19–34    |
|                | No. 200      |                |      |            | 10–20   | 5–15    | 5–15     |

#### Aggregate Gradation

#### 37-3.01C Construction

#### 37-3.01C(1) General

Before applying slurry seals or micro-surfacings, cover manholes, valve and monument covers, grates, and other exposed facilities located within the area of application using plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after application of the slurry seals or micro-surfacings.

#### 37-3.01C(2) Proportioning

Proportion slurry seal and micro-surfacing ingredients in compliance with the authorized mix design.

### 37-3.01C(3) Mixing and Spreading Equipment

#### 37-3.01C(3)(a) General

Mixing and spreading equipment for slurry seals and micro-surfacings must proportion the asphaltic emulsions, water, aggregate, and any additives by volume and mix them in continuous pug mill mixers.

Introduce emulsions into the mixer with a positive displacement pump. If you use a variable-rate pump, the adjusting unit must be sealed in its calibrated position.

Introduce water into the mixer through a meter that measures gallons.

Choose a truck mounted mixer-spreader or continuous self-loading mixer spreader.

#### 37-3.01C(3)(b) Truck Mounted Mixer Spreaders

Truck mounted mixer spreaders must comply with:

- 1. Rotating and reciprocating equipment must be covered with metal guards.
- 2. Proportion aggregate using a belt feeder with an adjustable cutoff gate. The Engineer verifies the height of the gate opening.
- 3. Belt feeder must have a depth monitor device. The depth monitor device must automatically shut down power to the belt feeder when the aggregate depth is less than 70 percent of the target depth.
- 4. Separate monitor device must detect the revolutions of the belt feeder. This device must automatically shut down power to the belt feeder if it detects no revolutions. If the belt feeder is an integral part of the equipment's drive chain, the monitor device is not required.
- 5. Aggregate belt feeder must be connected directly to the drive on the emulsion pump. The aggregate feeder drive shaft must have a revolution counter reading the nearest 0.10 revolution for micro-surfacing, and nearest 1 revolution for slurry seal.
- 6. Emulsion storage must be equipped with a device that automatically shuts down power to the emulsion pump and aggregate belt feeder when the level of stored emulsion is lowered. To allow for normal fluctuations, there may be a delay of 3 seconds between detection of low emulsion storage levels or low aggregate depths and automatic power shut down.
- 7. Emulsion storage must be located immediately before the emulsion pump.
- 8. Emulsion storage tank must have a temperature indicator at the pump suction level. The indicator must be accurate to ±5 degrees F.
- 9. No-flow and revolution warning devices must be in working condition. Low-flow indicators must be visible while walking alongside the equipment.

#### 37-3.01C(3)(c) Continuous Self-Loading Mixer Spreaders

Continuous self-loading mixer spreaders must be automatically sequenced and self-propelled. The mixing machine must deliver each material to a double shafted mixer and discharge the mixed material on a continuous flow basis. The mixing machines must have sufficient storage capacity to maintain a continuous supply of material to the proportioning controls. The mixing machine operators must have full control of forward and reverse speeds during placement.

#### 37-3.01C(3)(d) Spreader Boxes

The spreader boxes used to spread slurry seals and micro-surfacings must be:

- 1. Capable of spreading the slurry seal or micro-surfacing a minimum of 12 feet wide and preventing the loss of slurry seal or micro-surfacing.
- 2. Equipped with flexible rubber belting on each side. The belting must contact the pavement to prevent the loss of slurry seal or micro-surfacing from the box.
- Equipped to uniformly apply the slurry seal or micro-surfacing on superelevated sections and shoulder slopes. Micro-surfacing spreader box must be equipped with reversible motor driven augers.
- 4. Equipped with a series of strike-off devices at its rear.
  - 4.1. The leading strike off device must be:
    - 4.1.1. Fabricated of a suitable material such as steel or stiff rubber
    - 4.1.2. Designed to maintain close contact with the pavement during spreading
    - 4.1.3. Capable of obtaining the specified thickness
    - 4.1.4. Capable of being adjusted to the various pavement cross sections
  - 4.2. The final strike-off device must be:
    - 4.2.1. Fabricated of flexible material that produces a uniform texture in the finished surface

- 4.2.2. Cleaned daily and changed if longitudinal scouring occurs in the slurry seal of microsurfacing
- 5. Clean and free of slurry seal or micro-surfacing at the start of each work shift.

#### 37-3.01C(3)(e) Shoulder Equipment

Spread the slurry seal or micro-surfacing on shoulders with a device such as an edge box that forms clean and straight joints and edges.

#### 37-3.01C(3)(f) Equipment Calibration

Equipment calibration must comply with the *MPQP*. Notify the Engineer at least 5 business days before calibrating.

If the Department authorizes a truck or continuous mixer spreader, its calibration is valid for 6 months provided you:

- 1. Use the same truck or continuous mixer spreader verified with a unique identifying number
- 2. Use the same materials in compliance with the authorized mix design
- 3. Do not perform any repair or alteration to the proportioning systems

Calibrate the adjustable cut-off gate settings of each truck or continuous mixer spreader on the project to achieve the correct delivery rate of aggregate and emulsion per revolution of the aggregate feeder under the *MPQP*.

Checks must be performed for each aggregate source using an authorized vehicle scale.

Individual checks of the aggregate belt feeder's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 3 tons each.

Before using a variable-rate emulsion pump, the pump must be calibrated and sealed in the calibrated condition under the *MPQP*.

Individual checks of the emulsion pump's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 500 gal each.

#### 37-3.01C(4) Surface Preparation

Immediately before applying slurry seals or micro-surfacings, clean the surface to receive slurry seals or micro-surfacings by removing any extraneous material affecting adhesion of the slurry seal or micro-surfacing with the existing surface. Use self-propelled power brooms or other methods such as flushing to clean the existing pavement.

#### 37-3.01C(5) Placement

#### 37-3.01C(5)(a) General

If truck-mounted mixer-spreaders are used, keep at least 2 operational spreaders at the job site during placement.

Spread slurry seals and micro-surfacings uniformly and do not spot, rehandle, or shift the mixture. However in areas inaccessible to spreading equipment, spread the slurry seal or micro-surfacing mixtures with hand tools or other authorized methods. If placing with hand tools, lightly dampen the area first.

You may fog the roadway surface with water ahead of the spreader box. The fog spray must be adjusted for pavement:

- 1. Temperature
- 2. Surface texture
- 3. Dryness

You determine the application rates for slurry seals or micro-surfacings and the Engineer authorizes the application rates. Spread within 10 percent of authorized rate.

The mixtures must be uniform and homogeneous after spreading, and there must not be separation of the emulsion and aggregate after setting.

#### 37-3.01C(5)(b) Weather Conditions

Only place slurry seals or micro-surfacings if both the pavement and air temperatures are at least 50 degrees F and rising. The expected high temperature must be at least 65 degrees F within 24 hours after placement.

Do not place slurry seals or micro-surfacings if rain is imminent or the air temperature is expected to be below 36 degrees F within 24 hours after placement.

#### 37-3.01C(5)(c) Joints

Transverse and longitudinal joints must be:

- 1. Uniform
- 2. Straight
- 3. Neat in appearance
- 4. Without material buildup
- 5. Without uncovered areas

Transverse joints must be butt-type joints.

Prevent double placement at transverse joints over previously placed slurry seals or micro-surfacings.

Place longitudinal joints:

- 1. On centerlines, lane lines, edge lines, or shoulder lines
- 2. With overlaps not more than 4 inches

You may request other longitudinal joint patterns if they do not adversely affect the slurry seals or microsurfacings.

The maximum difference between the pavement surface and the bottom edge of a 12-foot straightedge placed perpendicular to the longitudinal joint must be 0.04 foot.

#### 37-3.01C(5)(d) Finished Surfaces

Finished slurry seals or micro-surfacings must be smooth and free of irregularities such as scratch or tear marks. You may leave up to 4 marks that are up to 1 inch wide and 6 inches long per 75 linear feet of slurry seal or micro-surfacing placed. Do not leave any marks that are over 1 inch wide or 6 inches long.

#### 37-3.01C(5)(e) Maintenance Sweeping

Sweep the slurry seals or micro-surfacings 24 hours after placement without damaging the slurry seals or micro-surfacings. For 4 days afterwards, sweep the slurry seals or micro-surfacings daily unless determined otherwise by the Engineer.

#### 37-3.01C(5)(f) Repair of Early Distress

The slurry seals or micro-surfacings must not show bleeding, raveling, separation, or other distresses for 15 days after placing. If bleeding, raveling, delaminating, rutting, or wash-boarding occurs after placing the slurry seals or micro-surfacings, make repairs using an authorized method.

#### 37-3.01D Payment

Not Used

#### 37-3.02 SLURRY SEALS

#### 37-3.02A General

#### 37-3.02A(1) Summary

Section 37-3.02 includes specifications for applying slurry seals.

Applying a slurry seal consists of spreading a mixture of asphaltic emulsion or polymer modified asphaltic emulsion, aggregate, additives, and water on a surface or pavement.

#### 37-3.02A(2) Definitions

Reserved

#### 37-3.02A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of asphaltic emulsion or polymer modified asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

#### 37-3.02A(4) Quality Assurance

#### 37-3.02A(4)(a) General

Reserved

#### 37-3.02A(4)(b) Quality Control

#### 37-3.02A(4)(b)(i) General

Take samples of asphaltic emulsion and polymer modified asphaltic emulsion from the tank truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer take two 1-quart samples in wide mouth plastic containers with lined, sealed lids for acceptance testing.

#### 37-3.02A(4)(b)(ii) Asphaltic Emulsion

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| Quality characteristic                                       | Test method | Minimum sampling and testing frequency | Sampling location |
|--------------------------------------------------------------|-------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 25<br>°C (Saybolt Furol seconds) |             |                                        |                   |
| Sieve Test (%)                                               |             | Minimum 1 per day per                  | Dolivory truck    |
| Storage stability, 1 day (%)                                 | AASHIOTSS   | delivery truck                         | Delivery truck    |
| Residue by distillation (%)                                  |             |                                        |                   |
| Particle charge <sup>a</sup>                                 |             |                                        |                   |
| Tests on Residue from Distillatior                           | n Test:     |                                        |                   |
| Penetration, 25 °C                                           | AASHTO T 49 | Minimum 1 per dev per                  |                   |
| Ductility                                                    | AASHTO T 51 | 1 Minimum 1 per day per Del            | Delivery truck    |
| Solubility in tricloroethylene                               | AASHTO T 44 |                                        |                   |

#### **Asphaltic Emulsion**

<sup>a</sup>If the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

#### 37-3.02A(4)(b)(iii) Polymer Modified Asphaltic Emulsion

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

#### **Polymer Modified Asphaltic Emulsion**

| Quality characteristic                             | Test method         | Minimum<br>sampling and<br>testing frequency | Sampling<br>Location |
|----------------------------------------------------|---------------------|----------------------------------------------|----------------------|
| Tests on emulsion:                                 |                     |                                              |                      |
| Saybolt Furol Viscosity at 25 °C                   | AASHTO T 59         |                                              |                      |
| (Saybolt Furol seconds)                            |                     | Minimum 1 nor                                |                      |
| Sieve test (%)                                     | AASHTO T 59         | day par delivery                             | Dolivory truck       |
| Storage stability after 1 day (%)                  | AASHTO T 59         | truck                                        | Delivery truck       |
| Residue by evaporation (min, %)                    | California Test 331 | liuuk                                        |                      |
| Particle charge                                    | AASHTO T 59         |                                              |                      |
| Tests on residue by evaporation:                   | _                   |                                              |                      |
| Penetration at 25 °C                               | AASHTO T 49         |                                              |                      |
| Ductility at 25 °C (min, mm)                       | AASHTO T 51         |                                              |                      |
| Torsional recovery (min, %)                        | California Test 332 | Minimum 1 per                                |                      |
| Or                                                 |                     | day per delivery<br>truck                    | Delivery truck       |
| Polymer content based on residual asphalt (min, %) | California Test 401 |                                              |                      |

#### 37-3.02A(4)(c) Department Acceptance

For a slurry seal asphaltic emulsion and polymer modified asphaltic emulsion, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                                  | Test method                      | Requirement    |
|---------------------------------------------------------|----------------------------------|----------------|
| Los Angeles Rattler loss (max, %)<br>At 500 revolutions | California Test 211 <sup>a</sup> | 35             |
| Percent of crushed particles (min, %)                   | California Test 205              | 95             |
| Durability (min)                                        | California Test 229              | 55             |
| Sand equivalent (min)<br>Type I<br>Type II<br>Type III  | California Test 217              | 45<br>55<br>60 |

#### Aggregate Acceptance Criteria

<sup>a</sup>California Test 211 must be performed on the source aggregate before crushing.

A sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If test results for sand equivalent do not comply with the specifications, you may remove the slurry seal represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$1.75 per ton of slurry seal for each noncompliant sand equivalent test.

#### 37-3.02B Materials

37-3.02B(1) General

Reserved

#### 37-3.02B(2) Asphaltic Emulsions

An asphaltic emulsion must comply with the requirements in Section 94. The asphaltic emulsion must be Grade CQS1h.

#### 37-3.02B(3) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must:

- 1. Consist of an elastomeric polymer mixed with an asphaltic material uniformly emulsified with water and an emulsifying or stabilization agent.
- 2. Use either neoprene polymer or butadiene and styrene copolymer. The polymer must be homogeneous and milled into the asphaltic emulsion at the colloid mill.
- 3. Be Grade PMCQS1h and must comply with the requirements shown in the following table:

| Polymer Modified Asphaltic Emulsion Requirements   |                     |             |  |
|----------------------------------------------------|---------------------|-------------|--|
| Quality characteristic                             | Test method         | Requirement |  |
| Tests on emulsion:                                 |                     |             |  |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol    | AASHTO T 59         | 15–90       |  |
| seconds)                                           |                     |             |  |
| Sieve test (%)                                     | AASHTO T 59         | 0–0.3       |  |
| Storage stability after 1 day (%)                  | AASHTO T 59         | 0–1         |  |
| Residue by evaporation (min, %)                    | California Test 331 | 60          |  |
| Particle charge                                    | AASHTO T 59         | Positive    |  |
| Tests on residue by evaporation:                   |                     |             |  |
| Penetration at 25 °C                               | AASHTO T 49         | 40–90       |  |
| Ductility at 25 °C (min, mm)                       | AASHTO T 51         | 400         |  |
| Torsional recovery (min, %)                        | California Test 332 | 18          |  |
| Or                                                 |                     |             |  |
| Polymer content based on residual asphalt (min, %) | California Test 401 | 2.5         |  |

#### 37-3.02B(4) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

| Aggi ogato Roquinonito                                  |                                  |                |  |
|---------------------------------------------------------|----------------------------------|----------------|--|
| Quality characteristic                                  | Test method                      | Requirement    |  |
| Los Angeles Rattler loss (max, %)<br>At 500 revolutions | California Test 211 <sup>a</sup> | 35             |  |
| Percent of crushed particles (min, %)                   | California Test 205              | 95             |  |
| Durability (min)                                        | California Test 229              | 55             |  |
| Sand equivalent (min)<br>Type I<br>Type II<br>Type III  | California Test 217              | 45<br>55<br>60 |  |

#### **Aggregate Requirements**

<sup>a</sup>California Test 211 must be performed on the source aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

#### 37-3.02B(5) Slurry Seal Mix Design

The slurry seal mix design, using project source aggregate, an asphaltic emulsion, and set-control agents if any, must comply with the requirements shown in the following table:

| Slurry Seal Mix Design Requirements         |                          |                   |  |
|---------------------------------------------|--------------------------|-------------------|--|
| Quality characteristic                      | Test method <sup>a</sup> | Requirement       |  |
| Consistency (max, mm)                       | Technical Bulletin 106   | 30                |  |
| Wet stripping                               | Technical Bulletin 114   | Pass              |  |
| Compatibility                               | Technical Bulletin 115   | Pass <sup>b</sup> |  |
| Cohesion test, within 1 hour (min, kg-mm)   | Technical Bulletin 139   | 200               |  |
| Wet track abrasion (max, g/m <sup>2</sup> ) | Technical Bulletin 100   | 810               |  |

<sup>a</sup>Test methods are by the International Slurry Surfacing Association.

<sup>b</sup>Mixing test must pass at the maximum expected air temperature at the job site during placement.

The mix design must have the percent of asphaltic residue, based on percentage by weight of the dry aggregate, within the ranges shown in the following table:

| Slurry seal type | Residue range |
|------------------|---------------|
| Type I           | 10–16         |
| Type II          | 7.5–13.5      |
| Type III         | 6.5–12.0      |

Determine the exact percentage based on the design asphalt binder content and the asphalt residual content of the asphaltic emulsion furnished.

#### 37-3.02C Construction

37-3.02C(1) General

Reserved

#### 37-3.02C(2) Proportioning

After proportioning, slurry seal mixtures must be workable.

#### 37-3.02C(3) Mixing and Spreading Equipment

Reserved

#### 37-3.02C(4) Placement

The slurry seal spread rates must be within the ranges shown in the following table:

| Slurry seal type | Application range           |
|------------------|-----------------------------|
|                  | (lb of dry aggregate/sq yd) |
| Type I           | 8–12                        |
| Type II          | 10–18                       |
| Type III         | 20–25                       |

#### Slurry Seal Spread Rates

Within 4 hours after placement, slurry seals must be set enough to allow traffic without pilot cars. Protect slurry seals from damage until it has set and will not adhere or be picked up by vehicle tires. Slurry seals must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

#### 37-3.02D Payment

The payment quantity for slurry seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion or polymeric asphaltic emulsion. The payment quantity for slurry seal does not include the weights of the added water and set-control additives.

#### 37-3.03 MICRO-SURFACINGS

#### 37-3.03A General

#### 37-3.03A(1) Summary

Section 37-3.03 includes specifications for applying micro-surfacings.

Applying a micro-surfacing consists of spreading a mixture of a micro-surfacing emulsion, water, additives, mineral filler, and aggregate on the pavement.

#### 37-3.03A(2) Definitions

Reserved

#### 37-3.03A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of micro-surfacing emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-3.03A(4) Quality Assurance 37-3.03A(4)(a) General Reserved

37-3.03A(4)(b) Quality Control

37-3.03A(4)(b)(i) General

Reserved

#### 37-3.03A(4)(b)(ii) Micro-surfacing Emulsions

Take samples from the truck tank at mid load from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart wide mouth plastic containers for acceptance testing.

For a micro-surfacing emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the quality characteristics shown in the following table:

|                                                                                                                                      | U                          |                                              |                      |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------|----------------------|
| Quality characteristic                                                                                                               | Test method                | Minimum sampling<br>and testing<br>frequency | Sampling<br>location |
| Tests on emulsion:                                                                                                                   |                            |                                              |                      |
| Saybolt Furol Viscosity, at 25°C<br>(Saybolt Furol seconds)<br>Storage stability, 1 day (max, %) <sup>a</sup><br>Sieve test (max, %) | AASHTO T 59                | Minimum 1 per day<br>per delivery truck      | Delivery truck       |
| Residue by evaporation (min, %)                                                                                                      | California Test<br>331     | Minimum 1 per day<br>per delivery truck      | Delivery truck       |
| Tests on residue from evaporation test:                                                                                              |                            |                                              |                      |
| Penetration at 25 °C<br>Softening point (min, °C)                                                                                    | AASHTO T 49<br>AASHTO T 53 | Minimum 1 per day<br>per delivery truck      | Delivery truck       |
|                                                                                                                                      | 1 10 1                     |                                              |                      |

**Micro-Surfacing Emulsion** 

<sup>a</sup>Storage stability test will be run if the storage exceeds 48 hours

#### 37-3.03A(4)(c) Department Acceptance

For micro-surfacing emulsions, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Micro-surfacing Emulsion Acceptance Criteria |                     |             |  |
|----------------------------------------------|---------------------|-------------|--|
| Quality characteristic                       | Test method         | Requirement |  |
| Tests on emulsion:                           |                     |             |  |
| Saybolt Furol Viscosity at 25 °C             | AASHTO T 59         | 15–90       |  |
| (Saybolt Furol seconds)                      |                     |             |  |
| Sieve test (%)                               | AASHTO T 59         | 0.30        |  |
| Storage stability, 1 day (max, %)            | AASHTO T 59         | 0–1         |  |
| Settlement <sup>a</sup> , 5 days (max, %)    | ASTM D244           | 5           |  |
| Residue by evaporation (min, %)              | California Test 331 | 62          |  |
| Tests on residue by evaporation:             |                     |             |  |
| Penetration at 25 °C                         | AASHTO T 49         | 40–90       |  |
| Softening point (min, °C)                    | AASHTO T 53         | 57          |  |

Micro-surfacing Emulsion Acceptance Criteria

<sup>a</sup>Settlement test on emulsion is not required if used within 48 hours of shipment.

Acceptance of aggregate, except mineral filler, is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                                  | Test method                      | Requirement |  |
|---------------------------------------------------------|----------------------------------|-------------|--|
| Los Angeles Rattler loss (max, %)<br>At 500 revolutions | California Test 211 <sup>a</sup> | 35          |  |
| Percent of crushed particles (min, %)                   | California Test 205              | 95          |  |
| Durability (min)                                        | California Test 229              | 65          |  |
| Sand equivalent (min)                                   | California Test 217              |             |  |
| Type II                                                 |                                  | 65          |  |
| Type III                                                |                                  | 65          |  |

Aggregate Acceptance Criteria

<sup>a</sup>California Test 211 must be performed on the aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

An aggregate sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If the test results for aggregate sand equivalent do not comply with the specifications, you may remove the micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$2.00 per ton of micro-surfacing for each noncompliant aggregate sand equivalent test.

#### 37-3.03B Materials

37-3.03B(1) General

#### Reserved

#### 37-3.03B(2) Micro-surfacing Emulsions

A micro-surfacing emulsion must be a homogeneous mixture of asphalt, an elastomeric polymer and an emulsifier solution.

Add an elastomeric polymer modifier to asphalt or emulsifier solution before emulsification. An elastomeric polymer solid must be a minimum of 3 percent by weight of the micro-surfacing emulsion's residual asphalt.

A micro-surfacing emulsion must comply with the requirements shown in the following table:

| Micro-surfacing Emulsion Requirements           |                     |             |  |
|-------------------------------------------------|---------------------|-------------|--|
| Quality characteristic                          | Test method         | Requirement |  |
| Tests on emulsion:                              |                     |             |  |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol | AASHTO T 59         | 15–90       |  |
| seconds)                                        |                     |             |  |
| Sieve test (%)                                  | AASHTO T 59         | 0.30        |  |
| Storage stability, 1 day (max, %)               | AASHTO T 59         | 0–1         |  |
| Settlement <sup>a</sup> , 5 days (max, %)       | ASTM D244           | 5           |  |
| Residue by evaporation (min, %)                 | California Test 331 | 62          |  |
| Tests on residue by evaporation:                |                     |             |  |
| Penetration at 25 °C                            | AASHTO T 49         | 40–90       |  |
| Softening point (min, °C)                       | AASHTO T 53         | 57          |  |

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<sup>a</sup>Settlement test on emulsion is not required if used within 48 hours of shipment.

#### 37-3.03B(3) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

| Quality characteristic                                  | Test method                      | Requirement |
|---------------------------------------------------------|----------------------------------|-------------|
| Los Angeles Rattler loss (max, %)<br>At 500 revolutions | California Test 211 <sup>a</sup> | 35          |
| Percent of crushed particles (min, %)                   | California Test 205              | 95          |
| Durability (min)                                        | California Test 229              | 65          |
| Sand equivalent (min)                                   | California Test 217              |             |
| Type II                                                 |                                  | 65          |
| Type III                                                |                                  | 65          |

**Aggregate Requirements** 

# <sup>a</sup>California Test 211 must be performed on the source aggregate before crushing. The

aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

#### 37-3.03B(4) Mineral Fillers

If a mineral filler is used, it must be type I or type II Portland cement. A mineral filler used during mix design must be used during production.

#### 37-3.03B(5) Micro-Surfacing Mix Designs

The micro-surfacing mix design must have the material proportion limits shown in the following table:

| more surrading mix besign reportion Limits           |                   |  |
|------------------------------------------------------|-------------------|--|
| Material                                             | Proportion limits |  |
| Micro-surfacing emulsion asphalt residual content (% | 5.5–10.5          |  |
| of dry weight of aggregate)                          |                   |  |
| Water and additives                                  | As Required       |  |
| Mineral filler (% of dry weight of aggregate)        | 0–3               |  |

#### Micro-surfacing Mix Design Proportion Limits

The micro-surfacing mix design must comply with the requirements shown in the following table:

| Micro-surfacing Mix Design Requirements          |                          |                     |  |
|--------------------------------------------------|--------------------------|---------------------|--|
| Quality characteristics                          | Test method <sup>a</sup> | Requirement         |  |
| Wet cohesion                                     |                          |                     |  |
| At 30 minutes (set) (min, kg-cm)                 | Technical Bulletin 139   | 12                  |  |
| At 60 minutes (traffic) (min, kg-cm)             |                          | 20                  |  |
| Excess asphalt (max, g/m <sup>2</sup> )          | Technical Bulletin 109   | 540                 |  |
| Wet stripping (min, %)                           | Technical Bulletin 114   | 90                  |  |
| Wet track abrasion loss                          | Technical Bulletin 100   |                     |  |
| 6-day soak (max, g/m²)                           | Technical Bulletin 100   | 810                 |  |
| Displacement                                     |                          |                     |  |
| Lateral (max, %)                                 | Technical Bulletin 147A  | 5                   |  |
| Specific gravity after 1000 cycles of 57 kg      |                          | 2.10                |  |
| (max)                                            |                          |                     |  |
| Classification compatibility (min, grade points) | Technical Bulletin 144   | (AAA, BAA) 11       |  |
| Mix time at 25 °C (min)                          | Technical Bulletin 113   | Controllable to 120 |  |
|                                                  |                          | seconds             |  |

<sup>a</sup>Test methods are by the International Slurry Surfacing Association.

#### 37-3.03B(6) Tack Coats

If there is a bid item for tack coat, you must coat the pavement surface with an asphaltic emulsion mixed with additional water before applying a micro-surfacing. The maximum ratio of water to asphaltic emulsion must be 2 to 1. Apply the tack coat at a rate from 0.08 to 0.15 gal/sq yd. The exact rate must be authorized.

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

#### 37-3.03C Construction

#### 37-3.03C(1) General

Reserved

#### 37-3.03C(2) Proportioning

Field conditions may require adjustments to the proportions within the authorized mix design during construction.

#### 37-3.03C(3) Mixing and Spreading Equipment

#### 37-3.03C(3)(a) General

Reserved

#### 37-3.03C(3)(b) Scratch Course Boxes

Spread the scratch courses with the same type of spreader box used to spread micro-surfacings except use an adjustable steel strike-off device instead of a final strike-off device.

#### 37-3.03C(3)(c) Wheel Path Depression Boxes

Each wheel path depression box must have adjustable strike-off device between 5 and 6 feet wide to regulate depth. The wheel path depression box must also have devices such as hydraulic augers capable of:

- 1. Moving the mixed material from the rear to the front of the filling chamber
- 2. Guiding larger aggregate into the deeper section of the wheel path depression
- 3. Forcing the finer material towards the outer edges of the spreader box

#### 37-3.03C(4) Test Strips

If micro-surfacing placement will require more than 1 day, you must construct a test strip. The test strip must be:

- 1. From 300 to 450 feet long
- 2. The same as the full production micro-surfacing
- 3. On 1 of the application courses specified at an authorized location

4. At the same time of day or night the full production micro-surfacing is to be applied

If multiple application courses are specified, you may construct test strips over 2 days or nights.

The Engineer evaluates the test strip after traffic has used it for 12 hours. If the Engineer determines the mix design or placement procedure is unacceptable, make modifications and construct a new test strip for the Engineer's evaluation.

### 37-3.03C(5) Placement

### 37-3.03C(5)(a) General

Reserved

#### 37-3.03C(5)(b) Repair Wheel Path Depressions

If repairing wheel path depressions is shown in plans, fill wheel path depressions and irregularities with micro-surfacing material before spreading micro-surfacing. If the depressions are less than 0.04 foot deep, fill with a scratch course. If the depressions are 0.04 foot deep or more, fill the depressions using a wheel path depression box.

Spread scratch courses by adjusting the steel strike-off of a scratch course box until it is directly in contact with the pavement surface.

Spread micro-surfacings with a wheel path depression box leaving a slight crown at the surface. Use multiple applications to fill depressions more than 0.12 foot deep. Do not apply more than 0.12 foot in a single application.

Allow traffic to compact each filled wheel path depression for a minimum of 12 hours before placing additional micro-surfacings.

#### 37-3.03C(5)(c) Micro-surfacing Pavement Surfaces

The micro-surfacing spread rates must be within the ranges shown in the following table:

| Micro-surfacing type  | Application range           |  |
|-----------------------|-----------------------------|--|
|                       | (lb of dry aggregate/sq yd) |  |
| Type II               | 10–20                       |  |
| Type III <sup>a</sup> | 20–32                       |  |
| Type III⁵             | 30–32                       |  |

<sup>a</sup>Over asphalt concrete pavement

<sup>b</sup>Over concrete pavement and concrete bridge decks

Within 2 hours after placement, micro-surfacings must be set enough to allow traffic without pilot cars. Protect the micro-surfacings from damage until it has set and will not adhere or be picked up by vehicle tires. Micro-surfacings must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

#### 37-3.03D Payment

The payment quantity for micro-surfacing is the weight determined by combining the weights of the aggregate and micro-surfacing emulsion. The payment quantity for micro-surfacing does not include the weights of added water, mineral filler, and additives.

#### 37-3.04 RUBBERIZED AND MODIFIED SLURRY SEALS

Reserved

#### 37-4 FOG SEALS AND FLUSH COATS

37-4.01 GENERAL

#### 37-4.01A General

#### 37-4.01A(1) Summary

Section 37-4.01 includes general specifications for applying fog seals and flush coats.

#### 37-4.01A(2) Definitions

Reserved

#### 37-4.01A(3) Submittals

At least 15 days before use, submit:

- 1. Sample of asphaltic emulsion in two 1-quart plastic container with lined, sealed lid
- 2. Asphaltic emulsion information and test data as follows:
  - 2.1. Supplier
  - 2.2. Type/Grade of asphalt emulsion
  - 2.3. Copy of the specified test results for asphaltic emulsion

#### 37-4.01B Materials

Not Used

#### 37-4.01C Construction

37-4.01C(1) General

Reserved

#### 37-4.01C(2) Weather Conditions

Only place a fog seal or flush coat if both the pavement and ambient temperatures are at least 50 degrees F and rising. Do not place a fog seal or flush coat within 24 hours of rain or within 24 hours of forecast rain or freezing temperatures.

#### 37-4.01D Payment

Not Used

#### 37-4.02 FOG SEALS

#### 37-4.02A General

#### 37-4.02A(1) Summary

Section 37-4.02 includes specifications for applying fog seals.

Applying a fog seal includes applying a diluted slow-setting or quick setting asphaltic emulsion.

#### 37-4.02A(2) Definitions

Reserved

#### 37-4.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic container of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-4.02A(4) Quality Assurance 37-4.02A(4)(a) General Reserved

37-4.02A(4)(b) Quality Control 37-4.02A(4)(b)(i) General

Reserved

#### 37-4.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take asphalt emulsion sample in two 1-quart plastic container with lined, sealed lid.

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

|                                | Asphaltic     | Emulsion              |                   |
|--------------------------------|---------------|-----------------------|-------------------|
| Quality characteristic         | Test Method   | Minimum sampling and  | Sampling location |
|                                |               | testing frequency     |                   |
| Saybolt Furol Viscosity, at    |               |                       |                   |
| 25 °C (Saybolt Furl seconds)   |               |                       |                   |
| Sieve Test (%)                 | Minimum 1 per | Minimum 1 per day per | Distributor truck |
| Storage stability, 1 day (%)   | AASHIUI 39    | delivery truck        | Distributor truck |
| Residue by distillation (%)    |               |                       |                   |
| Particle charge <sup>a</sup>   |               |                       |                   |
| Tests on Residue from Distilla | tion Test:    |                       |                   |
| Penetration, 25 °C             | AASHTO T 49   |                       |                   |
| Ductility                      | AASHTO T 51   | delivery truck        | Distributor truck |
| Solubility in tricloroethylene | AASHTO T 44   |                       |                   |

<sup>a</sup>If the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

#### 37-4.02A(4)(b)(iii) Asphaltic Emulsion Spread Rates

For fog seals, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

| Fog Seal Quality Control Requirement |
|--------------------------------------|
|--------------------------------------|

| Quality characteristic                     | Test method         | Minimum sampling      | Location of         |
|--------------------------------------------|---------------------|-----------------------|---------------------|
|                                            |                     | and testing frequency | sampling            |
| Asphaltic emulsion spread rate (gal/sq yd) | California Test 339 | 2 per day             | Pavement<br>surface |

#### 37-4.02A(4)(c) Department Acceptance

Fog seal acceptance is based on:

- 1. Visual inspection for the following:
  - 1.1. Uniform surface texture throughout the work limits
  - 1.2. Flushing consisting of the occurrence of a film of asphaltic material on the surface
  - 1.4 Streaking consisting of alternating longitudinal bands of asphaltic emulsion approximately parallel with the lane line
- 2. The Department's sampling and testing for compliance with the requirements for the quality characteristics specified in section 94 for asphaltic emulsion
- 3. Department's sampling and testing for compliance with the requirements for fog seal shown in the following table:

| Fog Seal | Acceptance | Criteria |
|----------|------------|----------|
|----------|------------|----------|

| Quality Characteristic                     | Test Method         | Requirement |
|--------------------------------------------|---------------------|-------------|
| Asphaltic emulsion spread rate (gal/sq yd) | California Test 339 | TV ± 10%    |

#### 37-4.02B Materials

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

#### 37-4.02C Construction

Apply asphaltic emulsions for fog seals at a residual asphalt rate from 0.02 to 0.06 gal/sq yd.

If additional water is added to the asphaltic emulsions, the resultant mixture must not be more than 1 part asphaltic emulsion to 1 part water. You determine the dilution rate.

If the fog seals become tacky, sprinkle water as required.

If fog seals and chip seals are on the same project, the joint between the seal coats must be neat and uniform.

#### 37-4.02D Payment

The Department does not adjust the unit price for an increase or decrease in the asphaltic emulsion quantity.

#### 37-4.03 FLUSH COATS

#### 37-4.03A General

#### 37-4.03A(1) Summary

Section 37-4.03 includes specifications for applying flush coats.

Applying a flush coat includes applying a fog seal coat followed by sand.

#### 37-4.03A(2) Definitions

Reserved

#### 37-4.03A(3) Submittals

At least 15 days before use, submit:

- 1. Proposed target X values for sand gradation.
- 2. Gradation test results for sand

Submit quality control test results for sand gradation within 2 business days of sampling.

#### 37-4.03A(4) Quality Assurance 37-4.03A(4)(a) General

Reserved

#### 37-4.03A(4)(b) Quality Control

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

#### Sand Quality Control

| Quality characteristic          | Test method            | Minimum sampling<br>and testing frequency | Location of<br>sampling    |
|---------------------------------|------------------------|-------------------------------------------|----------------------------|
| Gradation (% passing by weight) | California Test<br>202 | 1 per day                                 | See California<br>Test 125 |

#### 37-4.03A(4)(c) Department Acceptance

Flush coat acceptance is based on fog seal acceptance and the following:

- 1. Visual inspection for uniform application of sand.
- 2. Sand acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

#### Sand Gradation Acceptance Criteria

| Quality characteristic                                                                                           | Test method         | Requirement                                                                                           |
|------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------|
| Gradation (% passing by weight)<br>Sieve size:<br>3/8"<br>No. 4<br>No. 8<br>No. 16<br>No. 30<br>No. 50<br>No 100 | California Test 202 | 100           93–100           61–99           X ± 13           X ± 12           X ± 9           1–15 |
| No. 200                                                                                                          |                     | 0–10                                                                                                  |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

#### 37-4.03B Material

#### 37-4.03B(1) General

Reserved

#### 37-4.03B(2) Sand

Sand must be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.

Sand for a flush coat must comply with the gradations shown in the following table:

| Sand Gradation                  |                     |             |  |  |  |
|---------------------------------|---------------------|-------------|--|--|--|
| Quality characteristic          | Test method         | Requirement |  |  |  |
| Gradation (% passing by weight) |                     |             |  |  |  |
| Sieve size:                     |                     |             |  |  |  |
| 3/8"                            |                     | 100         |  |  |  |
| No. 4                           |                     | 93–100      |  |  |  |
| No. 8                           | California Test 202 | 61–99       |  |  |  |
| No. 16                          |                     | X ± 13      |  |  |  |
| No. 30                          |                     | X ± 12      |  |  |  |
| No. 50                          |                     | X ± 9       |  |  |  |
| No.100                          |                     | 1–15        |  |  |  |
| No. 200                         |                     | 0–10        |  |  |  |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

Fine aggregate sizes must be distributed such that the difference between the total percentage passing the No. 16 and No. 30 sieves is from 10 to 40, and the difference between the percentage passing the No. 30 and No. 50 sieves is from 10 to 40.

#### 37-4.03C Construction

#### 37-4.03C(1) General

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after applying asphaltic emulsions.

Spread sand aggregate with a mechanical device that spreads sand at a uniform rate over the full width of a traffic lane in a single application. Spread sand at a rate from 2 to 6 lb/sq yd. You determine the application rates for sand and the Engineer authorizes the application rate.

#### 37-4.03C(2) Sweeping

Sweep loose sand material remaining on the surface 24 hours after application.

#### 37-4.03D Payment

The Department does not adjust the unit price for an increase or decrease in the sand cover (seal) quantity.

#### 37-5 PARKING AREA SEALS

#### 37-5.01 GENERAL

#### 37-5.01A Summary

Section 37-5 includes specifications for applying parking area seals. Sealing a parking area consists of spreading a mixture of asphaltic emulsion, aggregate, polymer, and water.

#### 37-5.01B Definitions

Reserved

#### 37-5.01C Submittals

At least 15 days before starting placement, submit a 20 lb sample of the aggregate to be used.

At least 10 days before starting placement, submit:

- 1. Name of the authorized laboratory to perform testing and mix design.
- 2. Laboratory report of test results and a proposed mix design. The report and mix design must include the specific materials to be used and show a comparison of test results and specifications. The mix design report must include the quantity of water allowed to be added at the job site. The authorized laboratory performing the tests must sign the original laboratory report and mix design.
- 3. Manufacturer's data for oil seal primer and polymer.

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you request substitute materials, submit a new laboratory report and mix design at least 10 days before starting placement.

Submit a certificate of compliance for the parking area seal material.

Immediately after sampling, submit two 1-quart plastic containers of parking area seal taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

37-5.01D Quality Assurance
37-5.01D(1) General
Reserved
37-5.01D(2) Quality Control
37-5.01D(2)(a) General

Reserved

#### 37-5.01D(2)(b) Asphaltic Emulsions

For an asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

| Asphaltic Emulsion                      |             |                       |                   |  |  |  |
|-----------------------------------------|-------------|-----------------------|-------------------|--|--|--|
| Quality characteristic                  | Test Method | Minimum sampling      | Sampling          |  |  |  |
|                                         |             | and testing frequency | location          |  |  |  |
| Saybolt Furol Viscosity, at 25 °C       |             |                       |                   |  |  |  |
| (Saybolt Furol seconds)                 |             |                       |                   |  |  |  |
| Sieve Test (%)                          |             | Minimum 1 per day     | Distributor truck |  |  |  |
| Storage stability, 1 day (%)            | AA3010139   | per delivery truck    |                   |  |  |  |
| Residue by distillation (%)             |             |                       |                   |  |  |  |
| Particle charge <sup>a</sup>            |             |                       |                   |  |  |  |
| Tests on Residue from Distillation Test |             |                       |                   |  |  |  |
| Penetration, 25 °C                      | AASHTO T 49 | Minimum 1 por dov     |                   |  |  |  |
| Ductility                               | AASHTO T 51 | por dolivory truck    | Distributor truck |  |  |  |
| Solubility in trichloroethylene         | AASHTO T 44 |                       |                   |  |  |  |

<sup>a</sup>If the result of the particle char is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

#### 37-5.01D(2)(c) Sand

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

#### Sand Quality Control

| Quality characteristic          | Test method         | Minimum sampling and testing frequency | Location of<br>sampling    |
|---------------------------------|---------------------|----------------------------------------|----------------------------|
| Gradation (% passing by weight) | California Test 202 | One per project                        | See California Test<br>125 |

#### 37-5.01D(2)(d) Parking Area Seals

For a parking area seal, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

#### Parking Area Seal Requirements

| Quality characteristic                       | Test method         | Frequency       |
|----------------------------------------------|---------------------|-----------------|
| Mass per liter (kg)                          | ASTM D244           |                 |
| Cone penetration (mm)                        | California Test 413 |                 |
| Nonvolatile (%)                              |                     |                 |
| Nonvolatile soluble in trichloroethylene (%) | ASTIVI D2042        | One per project |
| Wet track abrasion (g/m <sup>2</sup> )       | ASTM D3910          |                 |
| Dried film color                             |                     |                 |
| Viscosity (KU) <sup>b</sup>                  | ASTM D562           |                 |

<sup>a</sup>Weigh 10 g of homogenous material into a previously tarred, small can. Place in a constant temperature oven at  $165 \pm 5$  °C for  $90 \pm 3$  minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

<sup>b</sup>Krebs units

#### 37-5.01D(3) Department Acceptance

Parking area seal acceptance is based on:

- 1. Visual inspection for:
  - 1.1. Uniform surface texture throughout the work limits
  - 1.2 Marks in the surface:
    - 1.2.1. Up to 4 marks in the completed parking area seal that are up to 1 inch wide and up to 6 inches long per 1,000 square feet of parking area seal placed.
    - 1.2.2. No marks in the completed parking area seal surface that are over 1 inch wide or 6 inches long.

- 1.2. Raveling consisting of the separation of the aggregate from the asphaltic emulsion
- 1.3. Bleeding consisting of the occurrence of a film of asphaltic material on the surface of the parking area seal
- 1.4 Delaminating of the parking area seal from the existing pavement
- 1.5 Rutting or wash-boarding
- 2. The Department's sampling and testing of aggregate for compliance with 100 percent passing no. 16 sieve under California Test 202
- 3. The Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic                       | Test method         | Requirement |
|----------------------------------------------|---------------------|-------------|
| Mass per liter (min, kg)                     | ASTM D244           | 1.1         |
| Cone penetration (mm)                        | California Test 413 | 340–700     |
| Nonvolatile (min, %)                         |                     | 50          |
| Nonvolatile soluble in trichloroethylene (%) | A31101 D2042        | 10–35       |
| Wet track abrasion (max, g/m <sup>2</sup> )  | ASTM D3910          | 380         |
| Dried film color                             |                     | Black       |
| Viscosity (min, KU) <sup>b</sup>             | ASTM D562           | 75          |

#### Parking Area Seal Acceptance Criteria

<sup>a</sup>Weigh 10 g of homogenous material into a previously tared, small ointment can. Place in a constant temperature oven at  $165 \pm 5$  °C for  $90 \pm 3$  minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight. <sup>b</sup>Krebs units

#### 37-5.02 MATERIALS

#### 37-5.02A General

Aggregate must be clean, hard, durable, uncoated, and free from organic and deleterious substances. One hundred percent of the aggregate must pass the no. 16 sieve.

Asphaltic emulsion must be either Grade SS1h or CSS1h, except the values for penetration at 25 degrees C for tests on residue from distillation must be from 20 to 60.

Polymer must be either neoprene, ethylene vinyl acetate, or a blend of butadiene and styrene.

Oil seal primer must be a quick-drying emulsion with admixtures. Oil seal primer must be manufactured to isolate the parking area seal from pavement with residual oils, petroleum grease, and spilled gasoline.

Crack sealant must comply with section 37-6.

Water must be potable and not separate from the emulsion before the material is placed.

#### 37-5.02B Mix Design

The proposed mix design for a parking area seal must comply with the requirements shown in the following table:

| Parking Area Sear Mix Design Requirements    |                     |             |  |  |  |
|----------------------------------------------|---------------------|-------------|--|--|--|
| Quality characteristic                       | Test method         | Requirement |  |  |  |
| Mass per liter (min, kg)                     | ASTM D244           | 1.1         |  |  |  |
| Cone penetration (mm)                        | California Test 413 | 340–700     |  |  |  |
| Nonvolatile (min, %)                         |                     | 50          |  |  |  |
| Nonvolatile soluble in trichloroethylene (%) | ASTIVI DZ042        | 10–35       |  |  |  |
| Wet track abrasion (max, g/m <sup>2</sup> )  | ASTM D3910          | 380         |  |  |  |
| Dried film color                             |                     | Black       |  |  |  |
| Viscosity (min, KU) <sup>b</sup>             | ASTM D562           | 75          |  |  |  |

Dauling Area Coal Mix Dealers Descriptions

<sup>a</sup>Weigh 10 g of homogenous material into a previously tarred, small ointment can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

<sup>b</sup>Krebs units

A parking area seal must contain a minimum of 2 percent polymer by volume of undiluted asphaltic emulsion.

#### 37-5.02C Proportioning

Parking area seal ingredients must be mixed at a central plant. The plant must include mechanical or electronic controls that consistently proportion the ingredients. Mix an asphaltic emulsion with the other ingredients mechanically.

Store the parking area seal in a tank equipped with mixing or agitation devices. Keep stored materials thoroughly mixed. Protect stored materials from freezing conditions.

#### 37-5.03 CONSTRUCTION

#### 37-5.03A General

Request that the Engineer shut off the irrigation control system at least 5 days before placing the seal. Do not water plants adjacent to the seal at least 24 hours before and after the seal coat placement.

#### 37-5.03B Surface Preparations

If cracks in the existing pavement are from 1/4 to 1 inch wide, treat the cracks under section 37-6. Do not place the parking area seals until the Engineer determines that the crack treatments are cured.

If cracks in the existing pavement are greater than 1 inch wide, the Engineer orders the repair. This work is change order work.

After any crack treatment and before placing parking area seals, clean the pavement surface, including removal of oil and grease spots. Do not use solvents.

If cleaning the pavement with detergents, thoroughly rinse with water. Allow all water to dry before placing parking area seals.

You must seal oil and grease spots that remain after cleaning. Use an oil seal primer and comply with the manufacturer's instructions.

If the existing pavement has oil and grease spots that do not come clean and sealing is insufficient, the Engineer orders the repair of the pavement. This work is change order work.

Before placing the parking area seals, dampen the pavement surface using a distributor truck. Place the seal on the damp pavement but do not place it with standing water on the pavement.

#### 37-5.03C Placement

If adding water at the job site based on the manufacturer's instructions for consistency and spreadability. do not exceed 15 percent by volume of undiluted asphaltic emulsion.

Place the parking area seals in 1 or more application. The seals must be uniform and smooth, free of ridges or uncoated areas.

If placing in multiple applications, allow the last application to thoroughly dry before the subsequent application.

Do not allow traffic on the parking area seals for at least 24 hours after placement.

Do not stripe over the parking area seals until it is dry.

#### 37-5.04 PAYMENT

The payment quantity for parking area seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion. The payment quantity for parking area seal does not include the added water and set-control additive.

#### **37-6 CRACK TREATMENTS**

#### 37-6.01 GENERAL

#### 37-6.01A Summary

Section 37-6 includes specifications for treating cracks in asphalt concrete pavement.

#### 37-6.01B Definitions

Reserved

#### 37-6.01C Submittals

If your selected crack treatment material is on the Authorized Material List for flexible pavement crack treatment material, submit a certificate of compliance including:

- 1. Manufacturer's name
- 2. Production location
- 3. Brand or trade name
- 4. Designation
- 5. Batch or lot number
- 6. Crack treatment material type
- 7. Contractor or subcontractor name
- 8. Contract number
- 9. Lot size
- 10. Shipment date
- 11. Manufacturer's signature

If your selected crack treatment material is not on the Authorized Material List for flexible pavement crack treatment material, submit a sample and test results from each batch or lot 20 days before use. Testing must be performed by an authorized laboratory and test results must show compliance with the specifications. Test reports must include the information specified for the certificate of compliance submittal. Each hot-applied crack treatment material sample must be a minimum of 3 lb and submitted in a silicone release container. Each cold-applied crack treatment material sample must be a minimum of 2 quarts and submitted in a plastic container.

At least 10 days before the start of work, submit sand gradation test results under California Test 202.

Submit the following with each delivery of crack treatment material to the job site:

- 1. Manufacturer's heating and application instructions
- 2. Manufacturer's SDS
- 3. Name of the manufacturer's recommended detackifying agent

#### 37-6.01D Quality Assurance

#### 37-6.01D(1) General

Hot-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect two 3-pounds-minimum samples of crack treatment material from the dispensing wand into silicone release boxes.

Cold-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect 2 samples of crack treatment material from the dispensing wand into 1-quart containers.

#### 37-6.01D(2) Quality Control

Reserved

#### 37-6.01D(3) Department Acceptance

Crack treatment acceptance is based on:

- 1. Visual inspection for uniform filling of cracks throughout the work limits including:
  - 1.2. Crack treatment is not more than a 1/4 inch below the specified level
  - 1.3. Sealant failures
  - 1.4. Crack re-opening
  - 1.5. Crack overbanding is less than 3 inches wide
- 2. The Department's sampling and testing for compliance with the requirements shown in the following table:

| Quality characteristic <sup>a</sup> | Tost mothod <sup>b</sup> |        | ŀ      | Requiremer | nt     |        |
|-------------------------------------|--------------------------|--------|--------|------------|--------|--------|
|                                     | Test method              | Type 1 | Type 2 | Туре 3     | Type 4 | Type 5 |
| Softening point (min, °C)           | ASTM D36                 | 102    | 96     | 90         | 84     | 84     |
| Cone penetration at 77 °F (max)     | ASTM D5329               | 35     | 40     | 50         | 70     | 90     |
| Resilience at 77 °F, unaged (%)     | ASTM D5329               | 20–60  | 25–65  | 30–70      | 35–75  | 40–80  |
| Flexibility (°C) <sup>c</sup>       | ASTM D3111               | 0      | 0      | 0          | -11    | -28    |
| Tensile adhesion (min, %)           | ASTM D5329               | 300    | 400    | 400        | 500    | 500    |
| Specific gravity (max)              | ASTM D70                 | 1.25   | 1.25   | 1.25       | 1.25   | 1.25   |
| Asphalt compatibility               | ASTM D5329               | Pass   | Pass   | Pass       | Pass   | Pass   |
| Sieve test (% passing)              | See note d               | 100    | 100    | 100        | 100    | 100    |

#### **Crack Treatment Acceptance Criteria**

<sup>a</sup>Cold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specified.

<sup>b</sup>Except for viscosity, cure each specimen at a temperature of  $23 \pm 2$  °C and a relative humidity of  $50 \pm 10$  percent for  $24 \pm 2$  hours before testing.

<sup>c</sup>For the flexibility test, the specimen size must be  $6.4 \pm 0.2$  mm thick by  $25 \pm 0.2$  mm wide by  $150 \pm 0.5$  mm long. The test mandrel diameter must be  $6.4 \pm 0.2$  mm. The bend arc must be 180 degrees. The bend rate must be  $2 \pm 1$  seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

<sup>d</sup>For hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

#### 37-6.02 MATERIALS

37-6.02A General

Reserved

#### 37-6.02B Crack Treatment Material

A crack treatment material must comply with the requirements shown in the following table:

| Crack Treatment Material            |                          |             |        |        |        |        |
|-------------------------------------|--------------------------|-------------|--------|--------|--------|--------|
| Quality abarastariatia <sup>a</sup> | Test method <sup>b</sup> | Requirement |        |        |        |        |
|                                     | restmethod               | Type 1      | Type 2 | Туре 3 | Type 4 | Type 5 |
| Softening point (min, °C)           | ASTM D36                 | 102         | 96     | 90     | 84     | 84     |
| Cone penetration at 77 °F (max)     | ASTM D5329               | 35          | 40     | 50     | 70     | 90     |
| Resilience at 77 °F, unaged (%)     | ASTM D5329               | 20–60       | 25–65  | 30–70  | 35–75  | 40–80  |
| Flexibility (°C) <sup>c</sup>       | ASTM D3111               | 0           | 0      | 0      | -11    | -28    |
| Tensile adhesion (min, %)           | ASTM D5329               | 300         | 400    | 400    | 500    | 500    |
| Specific gravity (max)              | ASTM D70                 | 1.25        | 1.25   | 1.25   | 1.25   | 1.25   |
| Asphalt compatibility               | ASTM D5329               | Pass        | Pass   | Pass   | Pass   | Pass   |
| Sieve test (% passing)              | See note d               | 100         | 100    | 100    | 100    | 100    |

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<sup>a</sup>Cold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specifications.

<sup>b</sup>Except for viscosity, cure each specimen at a temperature of  $23 \pm 2$  °C and a relative humidity of  $50 \pm$ 10 percent for  $24 \pm 2$  hours before testing.

<sup>c</sup>For the flexibility test, the specimen size must be 6.4  $\pm$  0.2 mm thick by 25  $\pm$  0.2 mm wide by 150  $\pm$  0.5 mm long. The test mandrel diameter must be  $6.4 \pm 0.2$  mm. The bend arc must be 180 degrees. The bend rate must be 2 ± 1 seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

<sup>d</sup>For hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

A crack treatment material must be delivered to the job site with the information listed below. If crack treatment material is delivered to the job site in containers, each container must be marked with the following information.

- 1. Manufacturer's name
- 2. Production location
- 3. Brand or trade name
- 4. Designation
- 5. Crack treatment trade name
- 6. Batch or lot number
- 7. Maximum heating temperature
- 8. Expiration date for cold application only

Hot-applied crack treatment must be delivered to the job site premixed in cardboard containers with meltable inclusion liners or in a fully meltable package.

Cold-applied crack treatment must have a minimum shelf life of 3 months from the date of manufacture.

#### 37-6.02C Sand

Sand applied to tacky crack treatment material must be clean, free of clay, and comply with the gradation shown in the following table:

| Quality characteristic          | Test method         | Requirement |
|---------------------------------|---------------------|-------------|
| Gradation (% passing by weight) |                     |             |
| Sieve size:                     |                     |             |
| No. 4                           | California Test 202 | 100         |
| No. 50                          |                     | 0–30        |
| No. 200                         |                     | 0–5         |

#### Sand Gradation

#### 37-6.03 CONSTRUCTION

Treat cracks from 1/4 to 1 inch in width for the entire length of the crack. Fill or repair cracks wider than 1 inch as ordered. Filling cracks wider than 1 inch is change order work.

If treating cracks on a traffic lane adjacent to a shoulder, treat the cracks on the shoulder.

For hot-applied crack treatment material, rout cracks or saw cut to form a reservoir.

Cracks must be clean and dry before treating. Before treating, blast cracks with oil-free compressed air at a pressure of at least 90 psi.

If the pavement temperature is below 40 degrees F or if there is evidence of moisture in the crack, use a hot air lance immediately before applying crack treatment. The hot air lance must not apply flame directly on the pavement.

Heat and apply hot-applied crack treatment material under with the manufacturer's instructions.

Apply cold-applied crack treatment material with a distributor kettle, a piston, or a diaphragm barrel pump that can deliver from 50 to 75 psi. The application line must have a pressure gauge and a filter. The pressure in the application line must not exceed 20 psi. The pressure gauge must have a regulator. Use a high-pressure hose with a 1/2-inch NPT swivel connection and a dispensing wand.

Apply crack treatment with a nozzle inserted into the crack. Fill the crack flush. If after 2 days the crack treatment is more than 1/4 inch below the specified level, the sealant fails, or the crack re-opens, re-treat the crack.

Immediately remove crack treatment material that is spilled or deposited on the pavement surface.

Before opening to traffic, apply sand or the manufacturer's recommended detackifying agent to tacky crack treatment material on the traveled way.

Sweep up excess sand before opening to traffic.

#### 37-6.04 PAYMENT

The payment quantity for crack treatment is the length measured in lane miles along the edge of each paved lane parallel to the pavement's centerline. The payment for a lane includes crack treatment of the adjacent shoulder.

#### 37-7-37-10 RESERVED

^^^^

#### **39 ASPHALT CONCRETE**

07-15-16

Replace *SP-2* at each occurrence in section 39 with:

MS-2

#### Replace the 3rd paragraph of section 39-2.01A(1) with:

WMA technologies must be on the Authorized Material List for WMA authorized technologies.

#### Add between the 3rd and 4th paragraphs of section 39-2.01A(1):

04-15-16

01-15-16

07-15-16

For HMA that uses asphalt binder containing crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of the project.

| Add to the table in the 4th paragraph of section 39-2.01A(1):                                                                                                                                                                           |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Asphalt Institute MS-2 7th edition (2015)                                                                                                                                                                                               | 01-15-16        |
| Add to item 8 in the 4th paragraph of section 39-2.01A(3)(b)(i):<br>, except lime supplier and source                                                                                                                                   | 07-15-16        |
| Replace the headings and paragraphs of section 39-2.01A(3)(i) with: 39-2.01A(3)(i) Reserved                                                                                                                                             | 01-15-16        |
| Replace the 2nd sentence in the 3rd paragraph of section 39-2.01A(4)(b) with:<br>Submit 3 parts and keep 1 part.                                                                                                                        | 01-15-16        |
| Add between single and test in the 7th paragraph of section 39-2.01A(4)(i)(i): aggregate or HMA                                                                                                                                         | 07-15-16        |
| Replace the 1st paragraph of section 39-2.01B(2)(b) with:                                                                                                                                                                               |                 |
| If the proposed JMF indicates that the aggregate is being treated with dry lime or lime slurry with marination, or the HMA with liquid antistrip, then testing the untreated aggregate under AASHTO T and AASHTO T 324 is not required. | 07-15-16<br>283 |

If HMA treatment is required or being used by the Contractor, determine the plasticity index of the aggregate blend under California Test 204.

#### Add between aggregate and with dry lime in the 3rd and 4th paragraphs of section 39-2.01B(2)(b):

07-15-16

blend

#### Replace the 9th through 11th paragraphs of section 39-2.01B(8)(a) with:

07-15-16

HMA must be produced at the temperatures shown in the following table:

| HWA Floduction Temperatures |                  |  |
|-----------------------------|------------------|--|
| HMA compaction              | Temperature (°F) |  |
| HMA                         |                  |  |
| Density based               | ≤ 325            |  |
| Method                      | 305–325          |  |
| HMA with WMA technology     |                  |  |
| Density based               | 240–325          |  |
| Method                      | 260–325          |  |

#### HMA Production Temperatures

#### Delete the 1st paragraph of section 39-2.01B(11).

#### Add after the 2nd paragraph of section 39-2.01B(11):

For miscellaneous areas and dikes:

- 1. Choose the aggregate gradation from:
  - 3/8-inch Type A HMA aggregate gradation 1.1.
  - 1/2-inch Type A HMA aggregate gradation 1.2.
  - 1.3. 1/2-inch dike mix aggregate gradation

- 2. Choose asphalt binder Grade PG 64-10, PG 64-16 or PG 70-10.
- 3. Minimum asphalt binder content must be:
  - 3.1. 6.40 percent for 3/8-inch Type A HMA aggregate gradation
  - 3.2. 5.70 percent for 1/2-inch Type A HMA aggregate gradation
  - 3.3. 6.40 percent for 1/2-inch dike mix aggregate gradation

If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content.

Aggregate gradation for 1/2-inch dike mix must be within the TV limits for the specified sieve size shown in the following table:

> Aggregate Gradation for 1/2-inch Dike Mix (Percentage Passing)

#### Replace item 4 in the 2nd paragraph of section 39-2.01C(1) with:

- 4. For method compaction:
  - 4.1. The temperature of the HMA and the HMA produced with WMA water injection technology in the windrow does not fall below 260 degrees F
  - 4.2. The temperature of the HMA produced using WMA additive technology in the windrow does not fall below 250 degrees F

Delete item 3 in the 8th paragraph of section 39-2.01C(1).

Replace 39-2.01A(3)(m)(iv) in the 6th paragraph of section 39-2.01C(3)(e) with:

36-3.01C(3)

Replace 2.06 in the 4th paragraph of section 39-2.01C(3)(f) with:

2.05

|            | · · · · · · · · · · · · · · · · · · · |                     |
|------------|---------------------------------------|---------------------|
| Sieve size | Target value limit                    | Allowable tolerance |
| 3/4"       | 100                                   |                     |
| 1/2"       | 90–95                                 | TV ± 5              |
| No. 4      | 70–75                                 | TV ± 5              |
| No. 8      | 23–25                                 | TV ± 5              |
| No. 50     | 15–35                                 | TV ± 5              |
| No. 200    | 7.0–13.0                              | TV ± 2.0            |
|            |                                       |                     |

07-15-16

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01-15-16

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04-15-16

| Add to the end of section 39-2.01C(15)(b):                                                                            |          |
|-----------------------------------------------------------------------------------------------------------------------|----------|
| The compacted lift thickness must not exceed 0.25 foot.                                                               | 07-15-16 |
| Add between <i>rectangles</i> and <i>with</i> in the 4th paragraph of section 39-2.01C(16):<br>, half the lane width, | 04-15-16 |
| Add between to and the in item 1 of the 4th paragraph of section 39-2.01C(16): and along                              | 04-15-16 |
| Delete <i>coat</i> in the 5th paragraph of section 39-2.01C(16).                                                      | 07-15-16 |
| Replace 37 in the 5th paragraph of section 39-2.01C(16) with: 37-4.02                                                 | 07-15-16 |

#### Replace section 39-2.02A(3)(b) with:

01-15-16

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

#### Add between the 1st and 2nd paragraphs of section 39-2.02C:

07-15-16

If the ambient air temperature is below 60 degrees F, cover the loads in trucks with tarpaulins. If the time for HMA discharge to truck at the HMA plant until transfer to paver's hopper is 90 minutes or greater and if the ambient air temperature is below 70 degrees F, cover the loads in trucks with tarpaulins, unless the time from discharging to the truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or the pavement surface.

#### Replace the table in the 2nd paragraph of section 39-2.02C with:

07-15-16

| Lift thickness                                                         | Ambient air (°F) |                  | Surface (°F)       |                  |
|------------------------------------------------------------------------|------------------|------------------|--------------------|------------------|
| (feet)                                                                 | Unmodified       | Modified asphalt | Unmodified asphalt | Modified asphalt |
|                                                                        | asphalt binder   | binder           | binder             | binder           |
| Type A HMA and Type A HMA produced with WMA water injection technology |                  |                  |                    |                  |
| <0.15                                                                  | 55               | 50               | 60                 | 55               |
| ≥0.15                                                                  | 45               | 45               | 50                 | 50               |
| Type A HMA produced with WMA additive technology                       |                  |                  |                    |                  |
| <0.15                                                                  | 45               | 45               | 50                 | 45               |
| ≥0.15                                                                  | 40               | 40               | 40                 | 40               |

#### Minimum Ambient Air and Surface Temperatures

#### Add between HMA and placed in the 1st sentence of the 4th paragraph of section 39-2.02C:

and Type A HMA produced with WMA water injection technology

#### Add between the 4th and the 5th paragraphs of section 39-2.02C:

For Type A HMA produced with WMA additive technology placed under method compaction, if the asphalt binder is:

- 1. Unmodified, complete:
  - 1.1 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
  - 1.2. Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
  - 1.3. Finish compaction before the surface temperature drops below 140 degrees F
  - 1.4 You may continue static rolling below 140 degrees F to remove roller marks.
- 2. Modified, complete:
  - 2.1. 1st coverage of breakdown compaction before the surface temperature drops below 230 degrees F
  - 2.2. Breakdown and intermediate compaction before the surface temperature drops below 170 degrees F
  - 2.3. Finish compaction before the surface temperature drops below 130 degrees F
  - 2.4. You may continue static rolling below 130 degrees F to remove roller marks.

#### Replace the 2nd paragraph of section 39-2.03A(3)(b) with:

01-15-16

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

## Replace the requirement in the row for *Voids in mineral aggregate on plant produced HMA* in the 2nd table in section 39-2.03A(4)(e)(i) with:

18.0-23.0

#### Add before the 1st paragraph of section 39-2.03A(4)(e)(ii)(C):

CRM used must be on the Authorized Materials List for Crumb Rubber Modifier.

CRM must be a ground or granulated combination of scrap tire crumb rubber and high natural scrap tire crumb rubber, CRM must be  $75.0 \pm 2.0$  percent scrap tire crumb rubber and  $25.0 \pm 2.0$  percent high natural scrap tire crumb rubber by total weight of CRM. Scrap tire crumb rubber and high natural scrap tire crumb rubber must be derived from waste tires described in Pub Res Code § 42703.

07-15-16

07-15-16

04-15-16

#### Replace the row for *Hamburg wheel track* in the table in section 39-2.03B(2) with:

| Hamburg wheel track (min, number of passes at the inflection point) | AASHTO T 324<br>(Modified) <sup>d</sup> |                  |
|---------------------------------------------------------------------|-----------------------------------------|------------------|
| Binder grade:<br>PG 58<br>PG 64                                     | (                                       | 10,000<br>12,500 |
| PG 70                                                               |                                         | 15,000           |

#### Replace *RHMA-G* in the 3rd and 5th paragraphs of section 39-2.03C with:

RHMA-G and RHMA-G produced with WMA water injection technology

#### Add between the 5th and 6th paragraphs of section 39-2.03C:

For RHMA-G produced with WMA additive technology placed under method compaction:

- 1. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 260 degrees F
- 2. Complete breakdown and intermediate compaction before the surface temperature drops below 230 degrees F
- 3. Complete finish compaction before the surface temperature drops below 180 degrees F
- 4. You may continue static rolling below 140 degrees F to remove roller marks

#### Replace the 6th and 7th paragraphs of section 39-2.04C with:

For HMA-O and HMA-O produced with WMA water injection technology:

- 1. With unmodified asphalt binder:
  - 1.1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.
  - 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
  - 1.3. Complete all compaction before the surface temperature drops below 200 degrees F.
- 2. With modified asphalt binder, except asphalt rubber binder:
  - 2.1. Spread and compact only if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F.
  - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
  - 2.3. Complete all compaction before the surface temperature drops below 180 degrees F.

For HMA-O produced with WMA additive technology:

- 1. With unmodified asphalt binder:
  - 1.1. Spread and compact only if the atmospheric temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F.
  - 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.
  - 1.3. Complete all compaction before the surface temperature drops below 190 degrees F.
- 2. With modified asphalt binder, except asphalt rubber binder:
  - 2.1. Spread and compact only if the atmospheric temperature is at least 40 degrees F and the surface temperature is at least 40 degrees F.
  - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.

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2.3. Complete all compaction before the surface temperature drops below 170 degrees F.

#### Replace RHMA-O and RHMA-O-HB in the 8th paragraph of section 39-2.04C with:

07-15-16

01-15-16

01-15-16

RHMA-O and RHMA-O produced with WMA water injection technology, and RHMA-O-HB and RHMA-O-HB produced with WMA water injection technology

#### Add between the 8th and 9th paragraphs of section 39-2.04C:

07-15-16 For RHMA-O produced with WMA additive technology and RHMA-O-HB produced with WMA additives technology:

- 1. Spread and compact if the ambient air temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F
- Complete the 1st coverage using 2 rollers before the surface temperature drops below 270 degrees F
- 3. Complete all compaction before the surface temperature drops below 240 degrees F

#### Add to the 2nd paragraph of section 39-2.05A(3)(b):

The material transfer vehicle must receive HMA directly from the truck.

#### Replace Table 6.1 at each occurrence in the table in section 39-2.05B(2) with:

| Table 8.1                                                                                                            |            |
|----------------------------------------------------------------------------------------------------------------------|------------|
| Replace <i>SP-2 Asphalt Mixture</i> in the 1st footnote in the table in the 2nd paragraph of se<br>2.05B(2)(b) with: | ection 39- |
| MS-2 Asphalt Mix Design Methods                                                                                      | 01-15-16   |

Replace Manual Series No. 2 (MS-2) in the 1st footnote in the table in the 2nd paragraph of section 39-2.05B(2)(b) with:

MS-2 Asphalt Mix Design Methods

#### Replace 39-3.05 in the 1st paragraph of section 39-3.04A with:

39-3.04

#### Add to the end of section 39-3.04A:

07-15-16 Schedule cold planing activities such that the pavement is cold planed, the HMA is placed, and the area is opened to traffic during the same work shift.

Delete the 2nd sentence of the 1st paragraph in section 39-3.04C(4).

07-15-16

01-15-16

Replace 39-3.06 in the 1st paragraph of section 39-3.05A with:

^^^^

### DIVISION VI STRUCTURES 47 EARTH RETAINING SYSTEMS

07-15-16

Replace the 6th paragraph in section 47-2.02A with:

Rock for rock slope protection at drain pipe outlets must be small-rock slope protection and must comply with the gradation specified for 7-inch-thick layer in section 72-4.02.

#### ^^^^

#### 49 PILING

07-15-16

#### Delete the 2nd paragraph of section 49-1.01A.

#### Replace the 1st sentence in the 5th paragraph of section 49-1.01D(3) with:

Load test and anchor piles must comply with the specifications for piling as described and Class N steel pipe piling.

#### Add to the list in 7th paragraph of section 49-1.01D(3):

 Welds that connect the anchor pile and the anchor pile head must be tested under section 49-2.02A(4)(b)(iii)(C)

#### Replace the 10th paragraph of section 49-1.01D(3) with:

Furnish labor, materials, tools, equipment, and incidentals as required to assist the Department in the transportation, installation, operation, and removal of Department-furnished steel load test beams, jacks, bearing plates, drills, and other test equipment. This is change order work.

#### Replace the 7th paragraph of section 49-1.01D(4) with:

Piles to be dynamically monitored must:

39-3.05

- 1. Have an additional length of 2 times the pile diameter plus 2 feet.
- 2. Be available to the Department at least 2 business days before driving.
- 3. Be safely supported at least 6 inches off the ground in a horizontal position on at least 2 support blocks. If requested, rotate the piles on the blocks.
- 4. Be positioned such that the Department has safe access to the entire pile length and circumference for the installation of anchorages and control marks for monitoring.

01-15-16

04-15-16

07-15-16

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07-15-16

| Delete <i>business</i> in item 6 in the list in the 8th paragraph of section 49-1.01D(4).                                                                                                            | 07-15-16 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Add to the list in 9th paragraph of section 49-1.01D(4):                                                                                                                                             |          |
| <ol> <li>Cut pile to the specified cut-off elevation after bearing acceptance criteria is provided by the<br/>Department</li> </ol>                                                                  | 07-15-16 |
| Delete the 3rd paragraph of section 49-1.03.                                                                                                                                                         | 04-15-16 |
| Delete the 2nd paragraph of section 49-1.04.                                                                                                                                                         | 04-15-16 |
| Delete the 4th paragraph of section 49-2.01C(5).                                                                                                                                                     | 01-15-16 |
| Replace item 3 in the list in the 2nd paragraph of section 49-3.01A with:                                                                                                                            |          |
| 3. CISS concrete piles                                                                                                                                                                               | 07-15-16 |
| Add between undisturbed material and in a dry in the 1st paragraph of section 49-3.010                                                                                                               | ):       |
| , casing, or steel shell                                                                                                                                                                             | 07-15-16 |
| Replace the 2nd and 3rd paragraphs of section 49-3.01C with:                                                                                                                                         | 07-15-16 |
| Place and secure reinforcement. Securely block the reinforcement to provide the minimum clearant shown between the reinforcing steel cage and the sides of the drilled hole, casing, or steel shell. |          |
| Steel shells, casings, and drilled holes must be clean and free of debris before reinforcement and concrete are placed.                                                                              |          |
| Replace <i>dewatered</i> in the 4th paragraphs of section 49-3.01C with:                                                                                                                             | 07-15-16 |
| drilled                                                                                                                                                                                              |          |
| Add to section 49-3.02A(1):                                                                                                                                                                          |          |
| Permanent steel casing and driven steel shell must comply with section 49-2.02.                                                                                                                      | 07-15-16 |
| Replace the paragraph of section 49-3.02A(2) with:                                                                                                                                                   | 07.45.40 |
| dry hole: A drilled hole that requires no work to keep it free of water.                                                                                                                             | 07-15-16 |
| dewatered hole: A drilled hole that:                                                                                                                                                                 |          |

1. Accumulates no more than 12 inches of water at the bottom during a 1 hour period without any pumping from the hole.

2. Has no more than 3 inches of water at the bottom immediately before placing concrete.

Replace item 8 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

3. Does not require temporary casing to control the groundwater.

### 07-15-16 8. Drilling plan and sequence 9. Concrete sequence and placement plan 10. If inspection pipes are required, methods for ensuring the inspection pipes remain straight, undamaged, and properly aligned during concrete placement Replace 1 business day in the paragraph of section 49-3.02A(3)(d) with: 07-15-16 2 business days Add to section 49-3.02A(3)(d): 07-15-16 The log must: 1. Show the pile location, tip elevation, cutoff elevation, dates of excavation and concrete placement, total quantity of concrete placed, length and tip elevation of any casing, and details of any hole stabilization method and materials used. 2. Include an 8-1/2 by 11 inch graph of concrete placed versus depth of hole filled as follows: Plot the graph continuously throughout concrete placement. Plot the depth of drilled hole filled 2.1. vertically with the pile tip at the bottom and the quantity of concrete placed horizontally. 2.2. Take readings at each 5 feet of pile depth, and indicate the time of the reading on the graph. Add after the sentence in the paragraph of section 49-3.02A(3)(e): 07-15-16 Allow 10 days for the review. Replace the 3rd sentence in the paragraph of section 49-3.02A(3)(f) with: Allow 10 days for the review and analysis of this report. Add after rejected pile in the 1st sentence in the 1st paragraph of section 49-3.02A(3)(g): 07-15-16 to be mitigated Delete the 2nd paragraph of section 49-3.02A(3)(g). Replace item 3 in the list in the 3rd paragraph of section 49-3.02A(3)(g) with: 07-15-16 3. Step by step description of the mitigation work to be performed, including drawings if necessary. If the ADSC Standard Mitigation Plan is an acceptable mitigation method, include the most recent version. For the most recent version of the ADSC Standard Mitigation Plan, go to: http://www.dot.ca.gov/hq/esc/geotech/ft/adscmitplan.htm

07-15-16
#### Replace the 2nd sentence in the paragraph of section 49-3.02A(3)(i) with:

Allow 10 days for the review.

#### Add to section 49-3.02A(3):

#### 49-3.02A(3)(j) Certifications

If synthetic slurry is used, submit as an informational submittal the names and certifications of your employees who are trained and certified by the synthetic slurry manufacturer.

#### Add after excavated hole in the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(c):

lined with plastic

#### Replace the 1st paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16 Section 49-3.02A(4)(d) applies to CIDH concrete piles except for piles (1) less than 24 inches in diameter or (2) constructed in dry or dewatered holes.

#### Replace gamma-gamma logging in the 2nd paragraph of section 49-3.02A(4)(d)(i) with:

GGL

#### Replace the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16 After notification by the Engineer of pile acceptance, fill the inspection pipes and cored holes with grout.

#### Replace gamma-gamma logging in section 49-3.02A(4)(d)(ii) with:

GGL

#### Replace the 3rd and 4th paragraphs of section 49-3.02A(4)(d)(iii) with:

The Department may perform CSL to determine the extent of the anomalies identified by GGL and to further evaluate a rejected pile for the presence of anomalies not identified by GGL. The pile acceptance test report will indicate if the Department intends to perform CSL and when the testing will be performed. Allow the Department 20 additional days for a total of 50 days to perform CSL and to provide supplemental results.

If authorized, you may perform testing on the rejected pile.

#### Delete the 8th paragraph of section 49-3.02A(4)(d)(iii).

#### Add to the end of section 49-3.02A(4)(d)(iii):

If the Engineer determines it is not feasible to repair the rejected pile, submit a mitigation plan for replacement or supplementation of the rejected pile.

07-15-16

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07-15-16

| Add to section 49-3.02A(4):                                                                                                                                                                                                                          |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 49-3.02A(4)(e) Certifications                                                                                                                                                                                                                        | 07-15-16           |
| If synthetic slurry is used, your employees who will be providing technical assistance in the slurry activities must be trained and certified by the synthetic slurry manufacturer to show their competence perform inspection of slurry operations. | cy to              |
| Replace section 49-3.02B(4) with:                                                                                                                                                                                                                    |                    |
| 49-3.02B(4) Reserved                                                                                                                                                                                                                                 | 07-15-16           |
|                                                                                                                                                                                                                                                      |                    |
| Replace <i>near</i> in the 3rd, 4th, and 5th paragraphs of section 49-3.02B(6)(b) with:                                                                                                                                                              | 07-15-16           |
| within 2 feet of                                                                                                                                                                                                                                     |                    |
| Poplace twice per shift in item 2 in the 3rd percentage of section $40.3.02P(6)(b)$ with:                                                                                                                                                            |                    |
|                                                                                                                                                                                                                                                      | 07-15-16           |
| every 4 nours                                                                                                                                                                                                                                        |                    |
|                                                                                                                                                                                                                                                      | 07-15-16           |
| Delete the 7th and 8th paragraphs of section 49-3.02B(6)(b).                                                                                                                                                                                         |                    |
|                                                                                                                                                                                                                                                      | 07-15-16           |
| Delete the 3rd paragraph of section 49-3.02B(6)(c).                                                                                                                                                                                                  |                    |
| Replace <i>near</i> in item 2 in the 4th paragraph of section 49-3.02B(6)(c) with:                                                                                                                                                                   |                    |
| within 2 feet of                                                                                                                                                                                                                                     | 07-15-16           |
|                                                                                                                                                                                                                                                      |                    |
| Replace item 5 in the 4th paragraph of section 49-3.02B(6)(c) with:                                                                                                                                                                                  | 07 15 16           |
| 5. After final cleaning and immediately before placing concrete.                                                                                                                                                                                     | 07-15-16           |
|                                                                                                                                                                                                                                                      |                    |
| Replace section 49-3.02B(9) with:                                                                                                                                                                                                                    |                    |
| 49-3.02B(9) Inspection Pipes                                                                                                                                                                                                                         | 07-15-16           |
| Inspection pipes must be schedule 40 PVC pipe complying with ASTM D1785 with a nominal pipe s 2 inches.                                                                                                                                              | size of            |
| Watertight PVC couplers complying with ASTM D2466 are allowed to facilitate pipe lengths in exce those commercially available.                                                                                                                       | ss of              |
| Add to the beginning of section 49-3.02C(1):                                                                                                                                                                                                         |                    |
| Unless otherwise authorized, drilling the hole and placing reinforcement and concrete in the hole m performed in a continuous operation.                                                                                                             | 07-15-16<br>ust be |

#### Replace the 5th paragraph of section 49-3.02C(2) with:

If slurry is used during excavation, maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

#### Replace the 1st sentence in the 9th paragraph of section 49-3.02C(2) with:

07-15-16

07-15-16

Remove water that has infiltrated the dewatered hole before placing concrete, as required for dewatered hole.

#### Replace the 1st sentence in the 10th paragraph of section 49-3.02C(2) with:

07-15-16

If authorized, to control caving or water seepage, you may enlarge portions of the hole, backfill the hole with slurry cement backfill, concrete, or other material, and redrill the hole to the diameter shown.

#### Replace the 4th paragraph of section 49-3.02C(3) with:

07-15-16

07-15-16

Remove the temporary casing during concrete placement. Maintain the concrete in the casing at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing, to prevent displacement of the concrete by material from outside the casing.

## Replace the 5th paragraph of section 49-3.02C(4) with:

For a single CIDH concrete pile supporting a column:

- 1. If the pile and the column share the same reinforcing cage diameter, this cage must be accurately placed as shown
- 2. If the pile reinforcing cage is larger in diameter than the column cage:
  - 2.1. Maintain a clear horizontal distance of at least 3.5 inches between the two cages, if the concrete is placed under dry conditions
  - 2.2. Maintain a clear horizontal distance of at least 5 inches between the two cages if the concrete is placed under slurry
  - 2.3. The offset between the centerlines of the two cages must not exceed 6 inches

#### Replace the paragraphs in section 49-3.02C(5) with:

For acceptance testing, install and test vertical inspection pipes as follows:

- 1. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.
- 2. Cap each inspection pipe at the bottom. Extend the pipe from 3 feet above the pile cutoff to the bottom of the reinforcing cage. Provide a temporary top cap or similar means to keep the pipes clean before testing. If pile cutoff is below the ground surface or working platform, extend inspection pipes to 3 feet above the ground surface or working platform.
- 3. If any changes are made to the pile tip, extend the inspection pipes to the bottom of the reinforcing cage.
- 4. Install inspection pipes in a straight alignment and parallel to the main reinforcement. Securely fasten inspection pipes in place and provide protective measures to prevent misalignment or damage to the inspection pipes during installation of the reinforcement and placement of concrete in the hole. Construct CIDH concrete piles such that the relative distance of inspection pipes to vertical steel reinforcement remains constant.
- 5. After concrete placement is complete, fill inspection pipes with water to prevent debonding of the pipe.
- 6. Provide safe access to the tops of the inspection pipes.

- 7. After placing concrete and before requesting acceptance testing, test each inspection pipe in the Engineer's presence by passing a rigid cylinder through the length of pipe. The rigid cylinder must be 1-1/4-inch diameter by 4.5-foot long, weigh 12 pounds or less, and be able to freely pass down through the entire length of the pipe under its own weight and without the application of force.
- 8. When performing acceptance testing, inspection pipes must provide a 2-inch-diameter clear opening and be completely clean, unobstructed, and either dry or filled with water as authorized.
- 9. After acceptance testing is complete, completely fill the inspection pipes with water.

If the rigid cylinder fails to pass through the inspection pipe:

- 1. Completely fill the inspection pipes in the pile with water immediately.
- 2. Core a nominal 2-inch-diameter hole through the concrete for the entire length of the pile for each inspection pipe that does not pass the rigid cylinder. Coring must not damage the pile reinforcement.
- 3. Locate cored holes as close as possible to the inspection pipes they are replacing and no more than 5 inches clear from the reinforcement.

Core holes using a double wall core barrel system with a split tube type inner barrel. Coring with a solid type inner barrel is not allowed.

Coring methods and equipment must provide intact cores for the entire length of the pile.

Photograph and store concrete cores as specified for rock cores in section 49-1.01D(5).

The coring operation must be logged by an engineering geologist or civil engineer licensed in the State and experienced in core logging. Coring logs must comply with the Department's *Soil and Rock Logging, Classification, and Presentation Manual* for rock cores. Coring logs must include core recovery, rock quality designation of the concrete, locations of breaks, and complete descriptions of inclusions and voids encountered during coring.

The Department evaluates the portion of the pile represented by the cored hole based on the submitted coring logs and concrete cores. If the Department determines a pile is anomalous based on the coring logs and concrete cores, the pile is rejected.

#### Replace item 2 in the list in the 2nd paragraph of section 49-3.02C(7) with:

2. Extend at least 5 feet below the construction joint. If placing casing into rock or a dry hole, the casing must extend at least 2 feet below the construction joint.

#### Add to the beginning of section 49-3.02C(9):

# 49-3.02C(9)(a) General Replace the 2nd sentence of the 3rd paragraph of section 49-3.02C(9) with: 04-15-16 Do not vibrate the concrete. 04-15-16 04-15-16 Add after concrete pump in the 8th paragraph of section 49-3.02C(9): 07-15-16 and slurry pump 07-15-16 Replace item 3 in the list in the 11th paragraph of section 49-3.02C(9) with:

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3. Maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

#### Replace the 13th paragraph of section 49-3.02C(9) with:

Maintain a log of concrete placement for each drilled hole.

#### Replace 14th and 15th paragraphs of section 49-3.02C(9) with:

If a temporary casing is used, maintain concrete placed under slurry at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing. The withdrawal of the casing must not cause contamination of the concrete with slurry.

The equivalent hydrostatic pressure inside the casing must be greater than the hydrostatic pressure on the outside of the casing to prevent intrusion of water, slurry, or soil into the column of freshly placed concrete.

Remove scum, laitance, and slurry-contaminated concrete from the top of the pile.

#### Add to section 49-3.02C(9):

#### 49-3.02C(9)(b) Mineral Slurry

Remove any caked slurry on the sides or bottom of hole before placing reinforcement.

If concrete is not placed immediately after placing reinforcement, the reinforcement must be removed and cleaned of slurry, the sides of the drilled hole must be cleaned of caked slurry, and the reinforcement again placed in the hole for concrete placement.

#### 49-3.02C(9)(c) Synthetic Slurry

A manufacturer's representative must:

- 1. Provide technical assistance for the use of their material
- 2. Be at the job site before introduction of the synthetic slurry into the drilled hole
- 3. Remain at the job site until released by the Engineer

**CAST-IN-STEEL SHELL CONCRETE PILING** 

After the manufacturer's representative has been released by the Engineer, your employee certified by the manufacturer must be present during the construction of the pile under slurry.

#### Replace the heading of section 49-3.03 with:

#### Replace the 1st paragraph of section 49-3.03A(1) with:

07-15-16

Section 49-3.03 includes specifications for constructing CISS concrete piles consisting of driven openended or closed-ended steel shells filled with reinforcement and concrete.

#### Add to the end of section 49-3.03A(1):

CISS concrete piles include Class 90 Alternative V and Class 140 Alternative V piles.

#### Add to section 49-3.03A(3):

Submit a Pile and Driving Data Form under section 49-2.01A(3)(a) if specified in the special provisions.

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#### Replace the paragraph of section 49-3.03D with:

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

#### Replace section 49-4.03 with:

#### 49-4.03 CONSTRUCTION

49-4.03A General

Reserved

#### 49-4.03B Drilled Holes

Drill holes for steel soldier piles into natural foundation material. Drilled holes must be accurately located, straight, and true.

Furnish and place temporary casings or tremie seals where necessary to control water or to prevent caving of the hole.

Before placing the steel soldier pile, remove loose materials existing at the bottom of the hole after drilling operations have been completed.

Do not allow surface water to enter the hole. Remove all water in the hole before placing concrete.

If temporary casings are used, they must comply with section 49-3.02C(3).

#### 49-4.03C Steel Soldier Piles

Plumb and align the pile before placing concrete backfill and lean concrete backfill. The pile must be at least 2 inches clear of the sides of the hole for the full length of the hole to be filled with concrete backfill and lean concrete backfill. Ream or enlarge holes that do not provide the clearance around steel piles.

Maintain alignment of the pile in the hole while placing backfill material.

Clean and prepare piles in anticipated heat affected areas before splicing steel piles or welding concrete anchors.

#### ^^^^

# **50 PRESTRESSING CONCRETE**

07-15-16 Add to the end of section 50-1.01C:

#### 50-1.01C(8) Post-tensioning Jack Calibration Chart

Submit the post-tensioning jack calibration plot.

#### 50-1.01C(9) Pretensioning Jack Calibration Chart

For any pretensioning jack calibrated by an authorized laboratory, submit a certified calibration plot.

#### Replace section 50-1.01D(2)(b) with:

# 50-1.01D(2)(b) Equipment and Calibration

#### 50-1.01D(2)(b)(i) General

Each jack body must be permanently marked with the ram area.

Each pressure gauge must be fully functional and have an accurately reading, clearly visible dial or display. The dial must be at least 6 inches in diameter and graduated in 100 psi increments or less.

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01-15-16

Each load cell must be calibrated and have an indicator that can be used to determine the force in the prestressing steel.

The range of each load cell must be such that the lower 10 percent of the manufacturer's rated capacity is not used in determining the jacking force.

Each jack must be calibrated equipped with its gauges.

Mechanically calibrate the gauges with a dead weight tester or other authorized means before calibration of the jacking equipment.

#### 50-1.01D(2)(b)(ii) Post-tensioning

Equip each hydraulic jack used to tension prestressing steel with 2 pressure gauges or 1 pressure gauge and a load cell. Only 1 pressure gauge must be connected to the jack during stressing.

Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:

- 1. Schedule the calibration of the jacking equipment with METS.
- 2. Verify that the jack and supporting systems are complete, with proper components, and are in good operating condition.
- 3. Provide labor, equipment, and material to (1) install and support the jacking and calibration equipment and (2) remove the equipment after the calibration is complete.
- 4. Plot the calibration results.

Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 180 days of use and after each repair.

#### 50-1.01D(2)(b)(iii) Pretensioning

Each jack used to pretension prestressing steel must be calibrated, equipped with its gauges, by a laboratory on the Authorized Laboratory List within 1 year of use and after each repair.

Calibrate pretensioning jacks:

- 1. Under ASTM E4 using an authorized laboratory. Certification that the calibration is performed to ASTM accuracy is not required.
- 2. In the presence of the Engineer. Notify the Engineer at least 2 business days before calibrating the jack.
- 3. Using 3 test cycles. Average the forces from each test cycle at each increment.
- 4. To cover the load range used in the work.

Gauges for pretensioning jacks may:

- 1. Be electronic pressure indicators that display either:
  - 1.1. Pressure in 100 psi increments or less
  - 1.2. Load to 1 percent of the maximum sensor/indicator capacity or 2 percent of the maximum load applied, whichever is smaller
- 2. Have a dial less than 6 inches in diameter

Gauges displaying pressure must have been calibrated within 1 year of the jack calibration.

Each hydraulic jack used for pretensioning must be equipped with either 2 gauges or 1 gauge and a load cell or you must have a calibrated standby jack with its gauge present on site during stressing.

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## **51 CONCRETE STRUCTURES**

#### 07-15-16

# Add to the list in the 2nd paragraph of section 51-1.01A:

|    |                 |                                                           | 07-15-16 |
|----|-----------------|-----------------------------------------------------------|----------|
|    |                 | Add to the list in the 6th paragraph of section 51-1.01A: |          |
| 9. | Drainage inlets |                                                           | 07-15-16 |
| 8. | Pile extensions |                                                           | 04-15-16 |
|    |                 |                                                           |          |

7. Drainage inlets

#### Add to section 51-1.02I:

07-15-16 Metal frames, covers, grates, and other miscellaneous iron and steel used with drainage inlets must comply with section 75-2.

#### Add to section 51-1.03B:

You may use PC drainage inlets as an alternative to CIP drainage inlets.

#### Add between the 10th and 11th paragraphs of section 51-1.03C(2)(a):

07-15-16

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For drainage inlets, extend the outside forms at least 12 inches below the top of the inlet. You may place concrete against excavated earth below this depth except:

- 1. You must use full-depth outside forms or other protection when work activities or unstable earth may cause hazardous conditions or contamination of the concrete.
- 2. You must increase the wall thickness 2 inches if placing concrete against the excavated surface. The interior dimensions must be as shown.

#### Add to section 51-1.03C(2)(b):

07-15-16

07-15-16

07-15-16

For drainage inlets, remove exterior forms to at least 12 inches below the final ground surface. Exterior forms below this depth may remain if their total thickness is not more than 1 inch.

#### Add to the list in the 2nd paragraph of section 51-1.03F(2):

4. Interior and top surfaces of drainage inlets

#### Add to section 51-1.04:

The payment quantity for structural concrete, drainage inlet is the volume determined from the dimensions shown for CIP drainage inlets.

#### Add to section 51-4.01C(1):

07-15-16

For PC drainage inlets, submit field repair procedures and a patching material test sample before repairs are made. Allow 10 days for the Engineer's review.

#### Add to section 51-4.01C(2)(a):

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

#### Add to section 51-4.01D(3):

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

- 1. Cracks more than 1/32 inch wide
- 2. Nonrepairable honeycombed or spalled areas of more than 6 square inches
- 3. Noncompliance with reinforcement tolerances or cross sectional area shown
- 4. Wall, inlet floor, or lid less than minimum thickness
- 5. Internal dimensions less than dimensions shown by 1 percent or 1/2 inch, whichever is greater
- 6. Defects affecting performance or structural integrity

#### Add to section 51-4.02C:

Materials for PC drainage inlets must comply with the following:

- 1. Preformed flexible joint sealant must be butyl-rubber complying with ASTM C990
- 2. Resilient connectors must comply with ASTM C923
- 3. Sand bedding must comply with section 19-3.02F(2)
- 4. Bonding agents must comply with ASTM C1059/C1059, Type II

#### Add to section 51-4.02D:

#### 51-4.02D(8) Drainage Inlets

PC units for drainage inlets must be rectangular, round, or oval in cross section, or any combination. Transitions from a rectangular grate opening to a round or oval basin must be made in not less than 8 inches. Provide means for field adjustment to meet final grade, paving, or surfacing.

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

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

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

#### Add to section 51-4.03:

#### 51-4.03H Drainage Inlets

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

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

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

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

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

| Replace the 2nd paragraph of section 51-7.01A with:                |          |
|--------------------------------------------------------------------|----------|
| Minor structures include structures described as minor structures. | 07-15-16 |
| Delete the 4th paragraph of section 51-7.01B.                      | 07-15-16 |
| Delete the 1st and 3rd paragraphs of section 51-7.01C.             | 07-15-16 |
| Delete the heading and paragraph of section 51-7.02.               | 07-15-16 |

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# **52 REINFORCEMENT**

01-15-16

#### Replace the 3rd paragraph of section 52-6.03B with:

01-15-16

For uncoated and galvanized reinforcing bars complying with ASTM A615/A615M, Grade 60, ASTM A706/A706M, or ASTM A767/A767M, Class 1, the length of lap splices must be at least:

- 1. 45 diameters of the smaller bar spliced for reinforcing bars no. 8 or smaller
- 2. 60 diameters of the smaller bar spliced for reinforcing bars nos. 9, 10, and 11

For epoxy-coated reinforcing bars and alternatives to epoxy-coated reinforcing bars complying with ASTM A775/A775M, ASTM A934/A934M, ASTM A1035/A1035M, or ASTM A1055/A1055M, the length of lap splices must be at least:

- 1. 65 diameters of the smaller bar spliced for reinforcing bars no. 8 or smaller
- 2. 85 diameters of the smaller bar spliced for reinforcing bars nos. 9, 10, and 11

#### ^^^^

# **53 SHOTCRETE**

01-15-16

Replace 632 in item 1 in the list in the 3rd paragraph of section 53-1.02 with:

01-15-16

675

#### Replace item 2 in the list in the 3rd paragraph of section 53-1.02 with:

2. You may substitute a maximum of 30 percent coarse aggregate for the fine aggregate. Coarse aggregate must comply with section 90-1, except section 90-1.02C(4)(d) does not apply. The gradation for the coarse aggregate must comply with the gradation specified in section 90-1.02C(4)(b) for the 1/2 inch x No. 4 or the 3/8 inch x No. 8 primary aggregate nominal size.

#### Replace shotcrete in the 2nd sentence of the 4th paragraph of section 53-1.02 with:

01-15-16

01-15-16

concrete

^^^^

# 56 OVERHEAD SIGN STRUCTURES, STANDARDS, AND POLES

07-15-16

Replace section 56-1.01 with:

07-15-16

# 56-1.01 GENERAL

56-1.01A Summary

Section 56-1 includes general specifications for constructing overhead sign structures, standards, and poles.

56-1.01B Definitions

Reserved

**56-1.01C Submittals** Reserved

56-1.01D Quality Assurance 56-1.01D(1) General

Reserved

56-1.01D(2) Quality Control 56-1.01D(2)(a) General Reserved

#### 56-1.01D(2)(b) Nondestructive Testing

#### 56-1.01D(2)(b)(i) General

Perform NDT of steel members under AWS D1.1 and the requirements shown in the following table:

| Weld location                                                                              | Weld type                                                      | Minimum required NDT                                                                                   |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Circumferential splices<br>around the perimeter of<br>tubular sections, poles,<br>and arms | CJP groove weld with backing ring                              | 100% UT or RT                                                                                          |
| Longitudinal seam                                                                          | CJP or PJP groove<br>weld                                      | Random 25% MT                                                                                          |
| Longitudinal seam within 6<br>inches of a circumferential<br>splice                        | CJP groove weld                                                | 100% UT or RT                                                                                          |
| Welds attaching base plates, flange plates, pole                                           | CJP groove weld with<br>backing ring and<br>reinforcing fillet | t≥ 5/16 inch: 100% UT and 100% MT<br>t< 5/16 inch: 100% MT after root weld<br>pass and final weld pass |
| plates, or mast arm plates<br>to poles or arm tubes                                        | External (top) fillet<br>weld for socket-type<br>connections   | 100% MT                                                                                                |
| Hand holes and other appurtenances                                                         | Fillet and PJP welds                                           | MT full length on random 25% of all standards and poles                                                |

# Nondestructive Testing for Steel Standards and Poles

NOTE: t = pole or arm thickness

| Weld location                                                                | Weld type                                                      | Minimum required NDT                                                                                         |
|------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Base plate to post                                                           | CJP groove weld<br>with backing ring<br>and reinforcing fillet | 100% UT and 100% MT                                                                                          |
| Base plate to gusset plate                                                   | CJP groove weld                                                | 100% UT                                                                                                      |
| Circumferential splices of pipe or tubular sections                          | CJP groove weld<br>with backing ring                           | 100% UT or RT                                                                                                |
| Split post filler plate welds                                                | CJP groove weld<br>with backing bar                            | 100% UT or RT                                                                                                |
| Longitudinal seam weld for<br>pipe posts                                     | CJP groove weld                                                | t < 1/4 inch: 100% MT<br>t ≥ 1/4 inch: 100% UT or RT                                                         |
|                                                                              | PJP groove weld                                                | Random 25% RT                                                                                                |
| Chord angle splice weld                                                      | CJP groove weld<br>with backing bar                            | 100% UT or RT                                                                                                |
| Truss vertical, diagonal, and wind angles to chord angles                    | Fillet weld                                                    | Random 25% MT                                                                                                |
| Upper junction plate to chord (cantilever type truss)                        | Fillet weld                                                    | Random 25% MT                                                                                                |
| Bolted field splice plates (tubular frame type)                              | CJP groove weld                                                | 100% UT and 100% MT                                                                                          |
| Cross beam connection plates<br>(lightweight extinguishable<br>message sign) | Fillet weld                                                    | Random 25% MT                                                                                                |
| Arm connection angles<br>(lightweight extinguishable<br>message sign)        | Fillet weld                                                    | 100% MT                                                                                                      |
| Mast arm to arm plate<br>(lightweight extinguishable<br>message sign)        | CJP groove weld<br>with backing ring                           | $t \ge 5/16$ inch: 100% UT and 100% MT<br>t < 5/16 inch: 100% MT after root<br>weld pass and final weld pass |
| Post angle to post (lightweight extinguishable message sign)                 | Fillet weld                                                    | 100% MT                                                                                                      |
| Hand holes and other appurtenances                                           | Fillet and PJP welds                                           | MT full length on random 25% of all<br>sign structures                                                       |

#### Nondestructive Testing for Overhead Sign Structures

NOTE: t = pole or arm thickness

#### 56-1.01D(2)(b)(ii) Ultrasonic Testing

For UT of welded joints with any members less than 5/16 inch thick or tubular sections less than 13 inches in diameter, the acceptance and repair criteria must comply with Clause 6.13.3.1 of AWS D1.1.

For UT of other welded joints, the acceptance and repair criteria must comply with Table 6.3 of AWS D1.1 for cyclically loaded nontubular connections.

After galvanization, perform additional inspection for toe cracks along the full length of all CJP groove welds at tube-to-transverse plate connections using UT.

When performing UT, use an authorized procedure under AWS D1.1, Annex S.

#### 56-1.01D(2)(b)(iii) Radiographic Testing

The acceptance criteria for radiographic or real time image testing must comply with AWS D1.1 for tensile stress welds.

#### 56-1.01D(2)(b)(iv) Longitudinal Seam Welds

The Engineer selects the random locations for NDT.

Grind the cover pass smooth at the locations to be tested.

| If repairs are required in a portion of a tested weld, perform NDT on the repaired portion and on 25 percent of the untested portions of the weld. If more repairs are required, perform NDT on the entire weld.                                                                                                                                                                                                                                                                                                                                     |                                  |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|--|--|--|
| 56-1.01D(3) Department Acceptance<br>Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                  |  |  |  |  |
| Replace section 56-2.01D(2)(b) with:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 07-15-16                         |  |  |  |  |
| Reserved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 07 10 10                         |  |  |  |  |
| Replace the 2nd sentence of the 1st paragraph of section 56-2.02F with:                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 07 15 16                         |  |  |  |  |
| Manufactured pipe posts must comply with one of the following:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 07-15-16                         |  |  |  |  |
| Add to the list in the 1st paragraph of section 56-2.02F:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |  |  |  |  |
| 4. ASTM A1085, Grade A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 07-15-16                         |  |  |  |  |
| Replace the 2nd paragraph of section 56-2.02F with:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |  |  |  |  |
| You may fabricate pipe posts from structural steel complying with ASTM A36/A36M, ASTM A709/A Grade 36, or ASTM A572/A572M, Grades 42 or 50.                                                                                                                                                                                                                                                                                                                                                                                                          | 07-15-16<br>709M,                |  |  |  |  |
| Delete the last sentence in the 1st paragraph of section 56-2.02K(2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 07-15-16                         |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 07-15-16                         |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:                                                                                                                                                                                                                                                                                                                                                                                                                                           | 07-15-16                         |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:<br>Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.                                                                                                                                                                                                                                                                                                                                                    | 07-15-16<br>07-15-16             |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:<br>Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.<br>Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:                                                                                                                                                                                                                                                                          | 07-15-16<br>07-15-16             |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:<br>Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.<br>Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:<br>The edges of handholes and other large post and arm openings must be ground smooth.                                                                                                                                                                                   | 07-15-16<br>07-15-16<br>07-15-16 |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:<br>Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.<br>Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:<br>The edges of handholes and other large post and arm openings must be ground smooth.<br>Replace the heading of section 56-3 with:                                                                                                                                      | 07-15-16<br>07-15-16<br>07-15-16 |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).<br>Replace the 2nd paragraph of section 56-2.02K(4) with:<br>Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.<br>Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:<br>The edges of handholes and other large post and arm openings must be ground smooth.<br>Replace the heading of section 56-3 with:<br>56-3 STANDARDS, POLES, PEDESTALS, AND POSTS                                                                                       | 07-15-16<br>07-15-16<br>07-15-16 |  |  |  |  |
| Delete the 3rd paragraph of section 56-2.02K(2).         Replace the 2nd paragraph of section 56-2.02K(4) with:         Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.         Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:         The edges of handholes and other large post and arm openings must be ground smooth.         Replace the heading of section 56-3 with:         56-3 STANDARDS, POLES, PEDESTALS, AND POSTS         Replace the paragraph in section 56-3.01A with: | 07-15-16<br>07-15-16<br>07-15-16 |  |  |  |  |

#### Replace section 56-3.01B(2)(b) with:

07-15-16

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07-15-16

Standards with handholes must comply with the following:

- 1. Include a UL-listed lug and 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for non-slip-base standards.
- 2. Attach a UL-listed lug to the bottom slip base plate with a 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for slip-base standards.

#### Replace the 1st sentence of the 3rd paragraph of section 56-3.01C(2)(a) with:

After each standard, pole, pedestal, and post is properly positioned, place mortar under the base plate.

#### Replace the 2nd sentence of the 4th paragraph of section 56-3.01C(2)(a) with:

The top of the foundation at curbs or sidewalks must be finished to curb or sidewalk grade.

#### Replace the 10th paragraph of section 56-3.01C(2)(a) with:

Except when located on a structure, construct foundations monolithically.

#### Replace the 13th paragraph of section 56-3.01C(2)(a) with:

07-15-16

Do not erect standards, poles, pedestals, or posts until the concrete foundation has cured for at least 7 days.

#### Replace the 14th paragraph in section 56-3.01C(2)(a) with:

07-15-16

The Engineer selects either the plumbing or raking technique for standards, poles, pedestals, and posts. Plumb or rake by adjusting the leveling nuts before tightening nuts. Do not use shims or similar devices. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made and each standard, pole, pedestal, and post on the structure is properly positioned, tighten nuts as follows:

- 1. Tighten leveling nuts and top nuts, following a crisscross pattern, until bearing surfaces of all nuts, washers, and base plates are in firm contact.
- 2. Use an indelible marker to mark the top nuts and base plate with lines showing relative alignment of the nut to the base plate.
- 3. Tighten top nuts following a crisscross pattern:
  - 3.1. Additional 1/6 turn for anchor bolts greater than 1-1/2 inches in diameter.
  - 3.2. Additional 1/3 turn for other anchor bolts.
  - 3.3. Tightening tolerance for all top nuts is  $\pm 1/8$  turn.

#### Replace the 1st sentence of the 4th paragraph of section 56-3.01C(2)(b) with:

07-15-16

If shown, use sleeve nuts on Type 1 standards.

# Add to section 56-3.01C(2)(b):

07-15-16

Spiral reinforcement must be continuous above the bottom of the anchor bolts. The top termination must be either:

- 1. 1'-6" lap beyond the end of pitch with a 90-degree hook extending to the opposite side of the cage, or
- 2. 1'-6" lap beyond the end of pitch with 2 evenly spaced authorized mechanical couplers

#### Replace the 1st sentence of the paragraph in section 56-3.02A(4)(b) with:

For cast slip bases for standards and poles with shaft lengths of 15 feet or more, perform RT on 1 casting from each lot of a maximum of 50 castings under ASTM E94.

#### Replace the 2nd paragraph of section 56-3.02B(1) with:

Material for push button posts, pedestrian barricades, and guard posts must comply with ASTM A53/A53M or ASTM A500/A500M.

#### Add to section 56-3.02B(1):

Steel pipe standards and mast arms must be hot dip galvanized after manufacturing. Remove spikes from galvanized surfaces.

#### Replace the 2nd paragraph of section 56-3.02B(2) with:

HS anchor bolts, nuts, and washers must comply with section 55-1.02D(1) and the following:

- 1. Bolt threads must be rolled
- Hardness of HS anchor bolts must not exceed 34 HRC when tested under ASTM F606
- 3. Galvanization must be by mechanical deposition
- 4. Nuts must be heavy-hex type

interference with the cap screw heads.

5. Each lot of nuts must be proof load tested

#### Replace the 2nd sentence of the 9th paragraph of section 56-3.02B(2) with:

07-15-16 During manufacturing, properly locate the position of the luminaire arm on the arm plate to avoid

#### Add to section 56-3.02B(3)(a):

Steel having a nominal thickness greater than 2 inches that is used for tube-to-transverse plate connections must have a minimum CVN impact value of 20 ft-lb at 20 degrees F when tested under ASTM E23.

#### Add to section 56-3.02B(3)(c):

The length of telescopic slip-fit splices must be at least 1.5 times the inside diameter of the exposed end of the female section.

For welds connecting reinforced handholes or box-type pole plate connections to a tubular member, the start and stop points must be at points located on a longitudinal axis of symmetry of the tube coinciding with the axis of symmetry of the hand hole or pole plate.

07-15-16

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07-15-16

#### Delete the 2nd paragraph of section 56-3.06C.

#### Replace the 1st sentence of the 3rd paragraph of section 56-3.06C with:

Mount the mast arm for luminaires to provide a 34-foot mounting height for a 165 W LED luminaire and a 40-foot mounting height for a 235 W LED luminaire.

#### ^^^^

#### **59 STRUCTURAL STEEL COATINGS**

07-15-16

Replace *Type* S in the 2nd paragraph of section 59-1.02A with:

Type M or Type S

critical.

#### Add to the list in the 2nd paragraph of section 59-1.02B:

5. Manufactured abrasives.

from structural steel and pipe.

#### Replace *Mineral and slag* in the 3rd paragraph of section 59-1.02B with:

Mineral, manufactured, and slag

**Slip Base Bolt Tightening Requirements** 

| Standard type | Torque (ft-lb) |
|---------------|----------------|
| 15-SB         | 150            |
| 15-SBF        | 150            |
| 30            | 150            |
| 31            | 200            |
|               |                |

Replace the 1st sentence of the 2nd paragraph of section 56-3.02C with:

Bolted connections attaching signal or luminaire arms to standards, poles, and posts are considered slip

Add to section 56-3.06B:

wire inlet and wood pole mounting brackets for the mast arm and tie-rod cross arm. Manufacture tie rod

07-15-16

04 45 40

01-15-16

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07-15-16 Manufacture the mast arm from standard pipe, free from burrs. Each mast arm must have an insulated

07-15-16

07-15-16

#### Delete the 4th paragraph of section 59-2.01C(1).

^^^^^

# 60 EXISTING STRUCTURES

#### 07-15-16

Delete the 2nd sentence in the 11th paragraph of section 60-3.04B(3)(c).

^^^^

# **64 PLASTIC PIPE**

07-15-16

Replace Reserved in section 64-3 with:

#### 64-3.01 GENERAL

#### 64-3.01A Summary

Section 64-3 includes specifications for constructing slotted plastic pipe.

Slotted plastic pipe includes structure excavation, concrete backfill, connecting new pipe to new or existing facilities, concrete collars, reinforcement, and other connecting devices.

#### 64-3.01B Definitions

Reserved

#### 64-3.01C Submittals

If an or equal slotted plastic pipe is being considered, it must be submitted 30 days before installation for approval.

If RSC is used for concrete backfill for slotted plastic pipe, submit the concrete mix design and test data from an authorized laboratory 10 days before excavating the pipe trench. The laboratory must specify the cure time required for the concrete mix to attain 2,000 psi compressive strength when tested under California Test 521.

Heel-resistant grates if specified must be submitted 30 days before installation for approval. Anchorage details must be included in the submittal.

#### 64-3.01D Quality Assurance

Reserved

#### 64-3.02 MATERIALS

64-3.02A General

Not Used

#### 64-3.02B Slotted Plastic Pipes

Slotted plastic pipe must be one of the following or equal:

| Slotted Plastic Pipe      |                 |  |  |  |  |  |
|---------------------------|-----------------|--|--|--|--|--|
| 12" diameter 18" diameter |                 |  |  |  |  |  |
| Zurn Z888-12              | Zurn Z888-18    |  |  |  |  |  |
| ACO Qmax 350              | ACO Qmax 365    |  |  |  |  |  |
| ADS Duraslot-12           | ADS Duraslot-18 |  |  |  |  |  |

07-15-16

#### 64-3.02C Concrete Backfill

Concrete for concrete backfill for slotted plastic pipe must comply with the specifications for minor concrete. You may use RSC instead of minor concrete for concrete backfill.

If RSC is used for concrete backfill, the RSC must:

- 1. Contain at least 590 pounds of cementitious material per cubic yard
- 2. Comply with section 90-3.02A, except section 90-1 does not apply
- 3. Comply with section 90-2

#### 64-3.02D Heel-Resistant Grates

Heel-resistant grate must:

- 1. Be designed to carry traffic loadings
- 2. Comply with ADA requirements
- 3. Be constructed of steel or cast iron
- 4. Be provided by the same manufacturer of the slotted plastic pipe
- 5. Comply with the manufacturer's instructions

#### 64-3.02E Bar Reinforcement

Bar reinforcement must comply with ASTM A615/A615M, Grade 60 or ASTM A706/A706M, Grade 60.

#### 64-3.02F Miscellaneous Metal

Ductile iron, nuts, bolts, and washers must comply with section 75.

#### 64-3.02G Grout

Grout must be non-shrink grout complying with ASTM C1107/C1107M.

#### 64-3.02H Curing Compound

Non-pigmented curing compound must comply with ASTM C309, Type 1, Class B.

#### 64-3.02I End Caps

End cap must:

- 1. Be provided by the same manufacturer of the slotted plastic pipe
- 2. Prevent concrete backfill from entering the pipe

#### 64-3.03 CONSTRUCTION

#### 64-3.03A General

Cover the grate slots with heavy-duty tape or other authorized covering during paving and concrete backfilling activities to prevent material from entering the slots.

#### 64-3.03B Preparation

Pave adjacent traffic lanes before installing slotted plastic pipes.

Excavation must comply with section 19-3.

#### 64-3.03C Installation

Lay and join slotted plastic pipes under the pipe manufacturer's instructions.

Lay pipes to line and grade with sections closely jointed and adequately secured to prevent separation during placement of the concrete backfill. If the pipes do not have a positive interlocking mechanism like a slot and tongue connection, secure the sections together with nuts, bolts, and washers before backfilling.

The top of slotted plastic pipes must not extend above the completed surface. Position the pipes so that the concrete backfill is flush with the surrounding grade and above the top of the grate from 1/8 to 1/4 inch.

Place channels with the male and female ends facing each other.

Place lateral support bar reinforcement on both sides of the grate slots. The support bar reinforcement must run the full length of the slots.

Anchor heel-resistant grates to the concrete backfill under the manufacturer's instructions.

#### 64-3.03D Concrete Backfill

Wherever minor concrete is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill within 7 days of placement.

Wherever RSC is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill before the required cure time of 2,000 psi is achieved.

Place concrete backfill where shown.

Consolidate the concrete backfill with high-frequency internal vibrators.

Texture the concrete backfill surface with a broom or burlap drag to produce a durable skid-resistant surface.

Apply a non-pigmented curing compound to the exposed concrete backfill surface whenever the atmospheric temperature is 90 degrees F or greater after placement.

#### 64-3.03E Transition Fittings

Use transition fittings to connect slotted plastic pipes to drainage inlets. The transition fittings must be supplied by the same pipe manufacturer.

Where welds are required in transition fittings, welds must comply with the pipe manufacturer's instructions. The completed welds must not have visible pinholes. Fill the gaps around the pipes in the inlet structure wall with non-shrink grout where the pipes connect to an existing drainage structure. Install the grout under the pipe manufacturer's instructions.

Cut the pipes as shown after the grout used to seal the transition fitting has cured for at least 24 hours.

#### 64-3.04 PAYMENT

Slotted plastic pipe is measured along the centerline of the pipe and parallel with the slope line. If the pipe is cut to fit a structure or slope, the payment quantity is the length of pipe necessary to be placed before cutting, measured in 2-foot increments.

^^^^

# DIVISION VII DRAINAGE FACILITIES 71 EXISTING DRAINAGE FACILITIES

01-15-16

Replace items 5 and 6 in the list in the 1st paragraph of section 71-3.01D with:

01-15-16

5. Performing postrehabilitation inspection

#### Add after the 4th paragraph of section 71-3.01D:

01-15-16

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

^^^^

# DIVISION VIII MISCELLANEOUS CONSTRUCTION 72 SLOPE PROTECTION

#### 07-15-16

#### Replace the 1st and 2nd paragraphs of section 72-2.02B with:

07-15-16

For method A and B placement and the class of RSP described, comply with the rock gradation shown in the following table:

| Rock Gradation          |                                                      |                                          |                                       |      |                                       |      |                       |        |                                |           |
|-------------------------|------------------------------------------------------|------------------------------------------|---------------------------------------|------|---------------------------------------|------|-----------------------|--------|--------------------------------|-----------|
| Nomina<br>by meo<br>dia | al RSP class<br>dian particle<br>ameter <sup>b</sup> | Nominal<br>median<br>particle            | d <sub>15</sub> <sup>c</sup> (inches) |      | d <sub>15</sub> <sup>c</sup> (inches) |      | d <sub>50</sub> ° (in | ches)  | d <sub>100</sub> c<br>(inches) | Placement |
| Class <sup>a</sup>      | Diameter<br>(inches)                                 | weight<br>W <sub>50</sub> <sup>c,d</sup> | Min                                   | Max  | Min                                   | Max  | Max                   | Method |                                |           |
| I                       | 6                                                    | 20 lb                                    | 3.7                                   | 5.2  | 5.7                                   | 6.9  | 12.0                  | В      |                                |           |
| II                      | 9                                                    | 60 lb                                    | 5.5                                   | 7.8  | 8.5                                   | 10.5 | 18.0                  | В      |                                |           |
| III                     | 12                                                   | 150 lb                                   | 7.3                                   | 10.5 | 11.5                                  | 14.0 | 24.0                  | В      |                                |           |
| IV                      | 15                                                   | 300 lb                                   | 9.2                                   | 13.0 | 14.5                                  | 17.5 | 30.0                  | В      |                                |           |
| V                       | 18                                                   | 1/4 ton                                  | 11.0                                  | 15.5 | 17.0                                  | 20.5 | 36.0                  | В      |                                |           |
| VI                      | 21                                                   | 3/8 ton                                  | 13.0                                  | 18.5 | 20.0                                  | 24.0 | 42.0                  | A or B |                                |           |
| VII                     | 24                                                   | 1/2 ton                                  | 14.5                                  | 21.0 | 23.0                                  | 27.5 | 48.0                  | A or B |                                |           |
| VIII                    | 30                                                   | 1 ton                                    | 18.5                                  | 26.0 | 28.5                                  | 34.5 | 48.0                  | A or B |                                |           |
| IX                      | 36                                                   | 2 ton                                    | 22.0                                  | 31.5 | 34.0                                  | 41.5 | 52.8                  | A      |                                |           |
| Х                       | 42                                                   | 3 ton                                    | 25.5                                  | 36.5 | 40.0                                  | 48.5 | 60.5                  | A      |                                |           |
| XI                      | 46                                                   | 4 ton                                    | 28.0                                  | 39.4 | 43.7                                  | 53.1 | 66.6                  | A      |                                |           |

<sup>a</sup>For RSP Classes I–VIII, use Class 8 RSP fabric. For RSP Classes IX–XI, use Class 10 RSP fabric. <sup>b</sup>Intermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness. <sup>c</sup>d%, where % denotes the percentage of the total weight of the graded material.

<sup>d</sup>Values shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

#### Replace the table in section 72-2.02C with:

| Fabric Class                                                |                |  |  |  |  |  |  |
|-------------------------------------------------------------|----------------|--|--|--|--|--|--|
| Class Largest rock gradation class used in slope protection |                |  |  |  |  |  |  |
| 8                                                           | Classes I–VIII |  |  |  |  |  |  |
| 10                                                          | Classes IX–XI  |  |  |  |  |  |  |

#### Replace the table in the 1st paragraph of section 72-3.02C with:

| Nominal RSP class by<br>median particle<br>diameter <sup>b</sup> |                  | Nominal<br>median<br>particle                                   | d <sub>15</sub> <sup>c</sup> |      | $d_{50}^{c}$ |      | d <sub>100</sub> <sup>c</sup> |
|------------------------------------------------------------------|------------------|-----------------------------------------------------------------|------------------------------|------|--------------|------|-------------------------------|
| Class <sup>a</sup>                                               | Size<br>(inches) | weight<br>W <sub>50</sub> <sup>c,d</sup><br>Weight <sup>a</sup> | Min                          | Max  | Min          | Max  | Мах                           |
|                                                                  | 6                | 20 lb                                                           | 3.7                          | 5.2  | 5.7          | 6.9  | 12.0                          |
| =                                                                | 9                | 60 lb                                                           | 5.5                          | 7.8  | 8.5          | 10.5 | 18.0                          |
| =                                                                | 12               | 150 lb                                                          | 7.3                          | 10.5 | 11.5         | 14.0 | 24.0                          |
| V                                                                | 18               | 1/4 ton                                                         | 11.0                         | 15.5 | 17.0         | 20.5 | 36.0                          |
| VII                                                              | 24               | 1/2 ton                                                         | 14.5                         | 21.0 | 23.0         | 27.5 | 48.0                          |

#### **Concreted-Rock Gradation**

<sup>a</sup>Use Class 8 RSP fabric.

<sup>b</sup>Intermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness. <sup>c</sup>d%, where % denotes the percentage of the total weight of the graded material.

<sup>d</sup>Values shown are based on the minimum and maximum particle diameters shown and an assumed specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

#### Replace the table in section 72-3.03E with:

07-15-16

| Minimum Concrete Penetration |                |    |    |   |   |  |  |
|------------------------------|----------------|----|----|---|---|--|--|
|                              | Rock class     |    |    |   |   |  |  |
|                              | VII V III II I |    |    |   |   |  |  |
| Penetration<br>(inches)      | 18             | 14 | 10 | 8 | 6 |  |  |

^^^^

# 73 CONCRETE CURBS AND SIDEWALKS

07-15-16

Replace section 73-3.01A with:

07-15-16

Section 73-3 includes specifications for constructing sidewalks, gutter depressions, island paving, curb ramps, and driveways.

#### ^^^^

# 74 PUMPING EQUIPMENT AND CONTROLS

04-15-16

Replace 87-1.03K in the 4th paragraph of section 74-3.03B(2) with:

04-15-16

87

^^^^

# **80 FENCES**

# 07-15-16

# Replace section 80-4 with:

#### 80-4 WILDLIFE EXCLUSION FENCES

#### 80-4.01 GENERAL

#### 80-4.01A General

Section 80-4 includes specifications for constructing wildlife exclusion fences.

Constructing a wildlife exclusion fence includes the installation of any signs specified in the special provisions.

#### 80-4.01B Materials

Each T post must:

- 1. Comply with ASTM A702
- 2. Be metal and have an anchor plate
- 3. Be painted black or galvanized

#### 80-4.01C Construction

Not Used

80-4.01D Payment

Not Used

#### 80-4.02 DESERT TORTOISE FENCES

#### 80-4.02A General

Section 80-4.02 includes specifications for constructing desert tortoise fences.

#### 80-4.02B Materials

#### 80-4.02B(1) Permanent Desert Tortoise Fences

#### 80-4.02B(1)(a) General

Each wire tie and hog ring for a permanent desert tortoise fence must comply with section 80-2.02F.

Each hold down pin must:

- 1. Be U-shaped, with 2 minimum 6-inch long legs
- 2. Have pointed ends
- 3. Be at least 11-gauge wire
- 4 Be galvanized
- 5. Be commercial quality

#### 80-4.02B(1)(b) Hardware Cloth

The hardware cloth must:

- 1. Comply with ASTM A740
- 2. Be welded or woven galvanized steel wire fabric
- 3. Be made of at least 14-gauge wire
- 4. Be 36 inches wide

#### 80-4.02B(1)(c) Barbless Wire

The barbless wire must:

- 1. Comply with ASTM A641/A641M
- 2. Be at least 14-gauge wire
- 3. Have a Class 1 zinc coating

#### 80-4.02B(1)(d) Posts

Each post must:

- 1. Comply with ASTM F1083
- 2. Be standard weight, schedule 40 steel pipe with a nominal pipe size of 1 inch
- 3. Be galvanized steel fence post conforming to ASTM A702

#### 80-4.02B(2) Temporary Desert Tortoise Fences

The materials for a temporary desert tortoise fence must comply with section 80-4.02B(1), except the hardware cloth must be made of at least 16-gauge wire.

#### 80-4.02C Construction

#### 80-4.02C(1) General

Extend the hardware cloth a minimum of 24 inches above the ground.

Plumb the posts and pull the hardware cloth taut. Correct any alignment issues.

#### 80-4.02C(2) Permanent Desert Tortoise Fences

Excavate the ground to form a trench before installing the posts and hardware cloth. Embed the posts at maximum 5-foot intervals into the ground. If T posts are used, use 5-foot lengths and embed the posts to match the above-ground height shown for the posts.

Securely fasten the hardware cloth to the posts with wire ties and to barbless wire with hog rings as shown. Pass the wire ties through the hardware cloth. Encircle the posts and barbless wire with the ties and tie them by twisting a minimum of 3 complete turns.

Bend the twisted ends of the ties down to prevent possible snagging. Close hog rings with their ends overlapping.

Bury the hardware cloth a minimum of 12 inches into the ground. Install the cloth in 1 continuous piece. You may cut the cloth into shorter segments if authorized.

Overlap the hardware cloth segments at posts, with a minimum overlap of 6 inches centered at a post. Wire tie the overlapped cloth to posts as shown. Prevent fraying by threading barbless wire along the vertical edges of the hardware cloth on either side of the post or use 3 equally spaced hog rings (6 hog rings per location) along each wire cloth edge.

Where bedrock or caliche substrate is encountered, use the bent hardware cloth detail if authorized. Transitions from buried-to-bent or bent-to-buried configuration must occur at a post location with a minimum 6-inch overlap of the hardware cloth as shown. The maximum spacing for hold down pins is 24 inches on center. Anchor in place with hold down pins the beginning and end corners of the hardware cloth placed on the ground.

Backfill the removed earth material into the trench created to install the hardware cloth and posts. Use an 8 lb or heavier hand tamper to compact the backfill around the posts and hardware cloth. Install a post at each corner of the cloth segments.

If a gate must be installed, attach the hardware cloth to the gate frame such that there is contact along the entire length of the gate between the finished ground surface and the lower edge of the cloth. Install the gate under section 80-10.

#### 80-4.02C(3) Temporary Desert Tortoise Fences

Fold the horizontal edge of the hardware cloth at a 90° angle toward the tortoise habitat area. Ensure the clearance to the ground at the bend is from 0 to 2 inches.

Where the hardware cloth overlaps, secure the bend piece with one of the following:

- 1. Barbless wire threaded along the width of the cloth
- 2. Minimum of 4 hog rings equally spaced along the edge

Fasten the bent piece to the ground with hold down pins pushed completely into the ground.

When the temporary fence is no longer needed, compact soil into post holes with an 8 lb or heavier hand tamper.

# 80-4.02D Payment

Not Used

# 80-4.03-80-4.09 RESERVED

|                                                                             | ^^^^^                                                                                                                                                                                                                      |          |  |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--|
| DIVISION IX TRAFFIC CONTROL DEVICES<br>83 RAILINGS AND BARRIERS<br>04-15-16 |                                                                                                                                                                                                                            |          |  |
|                                                                             | Delete to in the 4th paragraph of section 83-1.02B.                                                                                                                                                                        |          |  |
|                                                                             | ~~~~~~                                                                                                                                                                                                                     |          |  |
|                                                                             | 84 MARKINGS<br>07-15-16<br>Add to the beginning of section 84-8.03A:                                                                                                                                                       |          |  |
| Se                                                                          | lect the method and equipment for constructing ground-in indentations.                                                                                                                                                     | 07-15-16 |  |
|                                                                             | Replace the 1st paragraph of section 84-8.03A with:                                                                                                                                                                        |          |  |
| Do                                                                          | not construct rumble strips:                                                                                                                                                                                               | 07-15-16 |  |
| 1.<br>2.<br>3.<br>4.                                                        | On structures, approach slabs, or concrete weigh-in-motion slabs<br>At intersections<br>Bordering two-way left turn lanes, driveways, or other high-volume turning areas<br>Within 6 inches of any concrete pavement joint |          |  |
| Мс                                                                          | Add between the 2nd and 3rd paragraphs of section 84-8.03A:<br>odify rumble strip spacing to avoid locating a groove on a concrete pavement joint.                                                                         | 07-15-16 |  |
|                                                                             | Replace the 3rd paragraph of section 84-8.03A with:                                                                                                                                                                        | 07 15 16 |  |
| Ind                                                                         | dentations must comply with the dimensions shown and not vary more than:                                                                                                                                                   | 07-13-10 |  |
| 1.<br>2.<br>3.<br>4.                                                        | 10 percent in length<br>0.06 inch in depth<br>10 percent in width<br>1 inch in center-to-center spacing between rumble strips                                                                                              |          |  |

#### Add to the end of section 84-8.03A:

The noise level created by the combined grinding activities must not exceed 86 dBA when measured at a distance of 50 feet at right angles to the direction of travel. Break rumble strips before and after intersections, driveways, railroad crossings, freeway gore areas, and freeway ramps. Place breaks and break distances as shown. You may adjust breaks and the break distances as needed at low-volume driveways or other locations if authorized. 07-15-16 Delete new in the 1st paragraph of section 84-8.03B. 07-15-16 Add to the end of section 84-8.03B: Remove grinding residue under section 13-4.03E(7). Replace the 1st paragraph of section 84-8.03C with: 07-15-16 Construct rumble strips in the top layer of HMA and asphalt concrete surfacing by the ground-in method. Add between the 2nd and 3rd paragraphs of section 84-8.03C: 07-15-16 Dispose of the removed material. 07-15-16 Delete the 2nd paragraph of section 84-8.03C. Replace 37-2 in the 3rd paragraph of section 84-8.03C with: 07-15-16 37-4.02 Replace section 84-8.04 with: 07-15-16 The payment quantity for any type of rumble strip is the length measured by the station along the length of the rumble strip without deductions for gaps between indentations. Replace the 2nd paragraph of section 84-9.03B with: 04-15-16 Completely remove traffic stripes and pavement markings, including any paint in the gaps, by methods that do not remove pavement to a depth of more than 1/8 inch.

#### Add between the 2nd and 3rd paragraphs of section 84-9.03B:

04-15-16

07-15-16

Submit your proposed method for removing traffic stripes and pavement markings at least 7 days before starting the removal work. Allow 2 business days for the review.

Remove pavement marking such that the old message cannot be identified. Make any area removed by grinding rectangular. Water must not puddle in the ground areas. Fog seal ground areas on asphalt concrete pavement.

04-15-16

04-15-16

#### Delete materially in the 1st paragraph of section 84-9.03D.

^^^^^

# **DIVISION X ELECTRICAL WORK**

**Replace section 86 with:** 

#### **86 GENERAL**

04-15-16

#### 86-1.01 GENERAL

#### 86-1.01A Summary

Section 86 includes general specifications for furnishing electrical equipment and materials.

Electrical equipment and materials must comply with part 4 of the *California MUTCD* and 8 CA Code of Regs, chapter 4, subchapter 5, "Electrical Safety Orders."

Galvanized equipment and materials must comply with section 75-1.02B.

#### 86-1.01B Definitions

accessible pedestrian signal: Accessible pedestrian signal as defined in the California MUTCD.

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

actuation: Actuation as defined in the California MUTCD.

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

- **ambient sound sensing microphone:** Microphone that measures the ambient sound level in dB and automatically adjusts the accessible pedestrian signal speaker's volume.
- audible speech walk message: Audible prerecorded message that communicates to pedestrians which street has the walk interval.

channel: Discrete information path.

- **CALIPER:** Commercially Available LED Product Evaluation and Reporting. A U.S. Department of Energy program that individually tests and provides unbiased information on the performance of commercially available LED luminaires and lights.
- **controller assembly:** Assembly for controlling a system's operations, consisting of a controller unit and auxiliary equipment housed in a waterproof cabinet.

controller unit: Part of the controller assembly performing the basic timing and logic functions.

- **correlated color temperature:** Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.
- detector: Detector as defined in the California MUTCD.

electrolier: Assembly of a lighting standard and luminaire.

flasher: Device for opening and closing signal circuits at a repetitive rate.

**flashing beacon control assembly:** Assembly of switches, circuit breakers, terminal blocks, flasher, wiring, and other necessary electrical components housed in a single enclosure for operating a beacon.

- **house side lumens:** Lumens from a luminaire directed to light up areas between the fixture and the pole, such as sidewalks at intersection or areas off the shoulders on freeways.
- **illuminance gradient:** Ratio of the minimum illuminance on a 1-foot square of sign panel to that on an adjacent 1-foot square of sign panel.
- inductive loop detector: Detector capable of being actuated by an inductance change caused by a vehicle passing or standing over the loop. An inductive loop detector includes a loop or group of loops installed in the roadway and a lead-in cable installed and connected inside a controller cabinet.
- **junction temperature:** Temperature of the electronic junction of the LED device. The junction temperature is critical in determining photometric performance, estimating operational life, and preventing catastrophic failure of the LED.
- **L70:** Extrapolated life in hours of the luminaire when the luminous output depreciates 30 percent from the initial values.
- lighting standard: Pole and mast arm supporting the luminaire.
- LM-79: Test method from the Illumination Engineering Society of North America specifying the test conditions, measurements, and report format for testing solid state lighting devices, including LED luminaires.
- **LM-80:** Test method from the Illumination Engineering Society of North America specifying the test conditions, measurements, and report format for testing and estimating the long-term performance of LEDs for general lighting purposes.
- luminaire: Assembly that houses the light source and controls the light emitted from the light source.
- **National Voluntary Laboratory Accreditation Program:** U.S. Department of Energy program that accredits independent testing laboratories.
- powder coating: Coating applied electrostatically using exterior-grade, UV-stable, polymer powder.
- power factor: Ratio of the real power component to the complex power component.
- pretimed controller assembly: Assembly operating traffic signals under a predetermined cycle length.
- programming mechanism: Device to program the accessible pedestrian signal operation.
- **pull box:** Box with a cover that is installed in an accessible place in a conduit run to facilitate the pulling in of wires or cables.
- **push button information message:** Push button information message as defined in the *California MUTCD.*
- push button locator tone: Push button locator tone as defined in the California MUTCD.
- signal face: Signal face as defined in the California MUTCD.
- signal head: Signal head as defined in the California MUTCD.
- signal indication: Signal indication as defined in the California MUTCD.
- signal section: Signal section as defined in the California MUTCD.
- signal standard: Pole with or without mast arms carrying 1 or more signal faces.
- street side lumens: Lumens from a luminaire directed to light up areas between the fixture and the roadway, such as traveled ways and freeway lanes.
- **surge protection device:** Subsystem or component that protects equipment against short-duration voltage transients in power line.
- **total harmonic distortion:** Ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform.

traffic-actuated controller assembly: Assembly for operating traffic signals under the varying demands of traffic as registered by detector actuation.

traffic phase: Traffic phase as defined in the California MUTCD.

vehicle: Vehicle as defined in the California Vehicle Code.

vibrotactile pedestrian device: Vibrotactile pedestrian device as defined in the California MUTCD.

#### 86-1.01C Submittals

#### 86-1.01C(1) General

Within 15 days after Contract approval, submit a list of equipment and materials you propose to install.

Submit the list before shipping equipment and materials to the job site. The list must include:

- 1. Manufacturer's name
- 2. Make and model number
- 3. Month and year of manufacture
- 4. Lot and serial numbers
- 5. Contract number
- 6. Your contact information

Submit confirmation of the vendor's acceptance of the order for the electrical equipment and materials as an informational submittal.

Submit 3 sets of computer-generated, schematic wiring diagrams for each cabinet.

Diagrams, plans, and drawings must be prepared using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

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

Do not include costs for the traffic control system in the schedule of values.

Submit a manufacturer's maintenance manual or combined maintenance and operation manual as an informational submittal. The manual must have a master item index that includes:

- 1. Specifications
- 2. Design characteristics
- 3. General operation theory
- 4. Function of all controls
- 5. Troubleshooting procedure
- 6. Parts list, descriptions, stock numbers, and settings
- 7. Block circuit diagram
- 8. Layout of components
- 9. Schematic diagrams

#### 86-1.01C(2) Pull Boxes

Submit the manufacturer's installation instructions for pull boxes, including:

- 1. Quantity and size of entries that can be made without degrading the strength of the pull box below the load rating
- 2. Locations where side entries can be made
- 3. Acceptable method for creating the entry

Submit load-rating test reports for pull boxes from a NRTL.

#### 86-1.01C(3) LED Luminaires

Submit for an LED luminaire:

- 1. Maximum power in watts
- 2. Maximum designed junction temperature
- 3. Heat sink area in square inches

- 4. Designed junction-to-ambient thermal resistance calculation with thermal resistance components clearly defined
- 5. L70 in hours when extrapolated for the average nighttime operating temperature
- 6. Life expectancy based on the junction temperature
- 7. Manufacturer's data sheet for the power supply, including the rated life

Submit the manufacturer's QC test data for LED luminaires as an informational submittal.

#### 86-1.01C(4) Low-Pressure Sodium Luminaires

Submit the manufacturer's QC test data for low-pressure sodium luminaires as an informational submittal.

#### 86-1.01C(5) Service Equipment Enclosures

Submit shop drawings for a service equipment enclosure to METS.

#### 86-1.01C(6) Signal Heads

Submit a certificate of compliance and the manufacturer's QC test data for signal heads as an informational submittal.

#### 86-1.01C(7) LED Signal Modules

Submit the manufacturer's QC test data for LED signal modules as an informational submittal.

#### 86-1.01C(8) Visors

Submit a certificate of compliance and the manufacturer's QC test data for visors as an informational submittal.

#### 86-1.01C(9) LED Countdown Pedestrian Signal Face Modules

Submit the manufacturer's QC test data for LED countdown pedestrian signal face modules as an informational submittal.

#### 86-1.01C(10) Accessible Pedestrian Signals

Submit the manufacturer's QC test data for accessible pedestrian signals as an informational submittal.

#### 86-1.01D Quality Assurance

#### 86-1.01D(1) General

Electrical equipment must comply with one or more of the following standards:

- 1. ANSI
- 2. ASTM
- 3. EIA/ECIA
- 4. NEMA
- 5. NETA
- 6. UL/NRTL
- 7. TIA

Materials must comply with:

- 1. FCC rules
- 2. ITE standards
- 3. NEC
- 4. California Electrical Code

#### 86-1.01D(2) Source Quality Control

Service equipment enclosures and cabinets must be inspected and tested at the source.

#### 86-1.01D(3) Department Acceptance

Deliver material and equipment for testing to METS.

Allow 30 days for testing. The Department notifies you when testing is complete.

If the Department accepts the material or equipment, you must pick it up from the test site and deliver it to the job site.

If the Department rejects material or equipment, remove it within 5 business days after you are notified it is rejected. If it is not removed within that period, the Department may remove it and ship it to you and deduct the costs of labor, material and shipping.

Resubmit a new sample and allow 30 days for retesting. The retesting period starts when the replacement material or equipment is delivered to METS.

#### 86-1.02 MATERIALS

#### 86-1.02A General

Anchor bolts, anchor bars or studs, and nuts and washers must comply with section 75-1.02.

Bolt threads must accept galvanized standard nuts without requiring tools or causing removal of protective coatings.

#### 86-1.02B Conduit and Accessories

#### 86-1.02B(1) General

Conduit and fittings must comply with the requirements shown in the following table:

| Туре | Requirement                                                                                                                                                                                                                                                                                              |  |  |  |  |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| 1    | Must be hot-dip galvanized rigid steel complying with UL 6 and ANSI C80.1. The zinc coating must comply with copper sulfate test requirements in UL 6. Fittings must be electrogalvanized                                                                                                                |  |  |  |  |
|      | and certified under UL 514B.                                                                                                                                                                                                                                                                             |  |  |  |  |
| 2    | Must comply with requirements for Type 1 conduit and be coated with PVC or polyethylene.<br>The exterior thermoplastic coating must have a minimum thickness of 35 mils. The internal<br>coating must have a minimum thickness of 2 mils. Coated conduit must comply with NEMA RN<br>1, or NRTL PVC-001. |  |  |  |  |
| 3    | Must be Type A, extruded, rigid PVC conduit complying with UL 651 or must be HDPE conduit complying with UL 651A.                                                                                                                                                                                        |  |  |  |  |
| 4    | Must have an inner, flexible metal core covered by a waterproof, nonmetallic, sunlight-resistant jacket, and must be UL listed for use as a grounding conductor. Fittings must be certified under UL 514B.                                                                                               |  |  |  |  |
| 5    | Must be intermediate steel complying with UL 1242 and ANSI C80.6. The zinc coating must comply with copper sulfate test requirements specified in UL 1242. Fittings must be electrogalvanized and certified under UL 514B.                                                                               |  |  |  |  |

# **Conduit and Fitting Requirements**

Bonding bushings installed on metal conduit must be insulated and either a galvanized or zinc-alloy type.

#### 86-1.02B(2) Structures Accessories

Steel hangers, steel brackets, and other fittings used to support conduit in or on a wall or bridge superstructure must comply with section 75-3.

Precast concrete cradles for conduit must be made of minor concrete and commercial-quality welded wire fabric. The minor concrete must contain a minimum of 590 lb of cementitious material per cubic yard. The cradles must be moist cured for a minimum of 3 days.

#### 86-1.02C Pull Boxes

#### 86-1.02C(1) General

Pull box cover must have a marking on the top that is:

- 1. Clearly defined
- 2. Uniform in depth
- 3. Parallel to either side
- 4. 1 to 3 inches in height

Cover marking must be:

- 1. SERVICE for service circuits between a service point and service disconnect
- 2. SERVICE IRRIGATION for circuits from a service equipment enclosure to an irrigation controller
- 3. SERVICE BOOSTER PUMP for circuits from a service equipment enclosure to the booster pump
- 4. TDC POWER for circuits from a service equipment enclosure to telephone demarcation cabinet
- 5. *LIGHTING* for a lighting system
- 6. SIGN ILLUMINATION for a sign illumination system
- 7. SIGNAL AND LIGHTING for a signal and lighting system
- 8. *RAMP METER* for a ramp metering system
- 9. TMS for a traffic monitoring station
- 10. FLASHING BEACON for a flashing beacon system
- 11. CMS for a changeable message sign system
- 12. *INTERCONNECT* for an interconnect conduit and cable system

The load rating must be stenciled on the inside and outside of the pull box and the cover.

If a transformer or other device must be placed in the pull box, include recesses for a hanger.

The hardware must be stainless steel with 18 percent chromium and 8 percent nickel content.

#### 86-1.02C(2) Nontraffic Pull Boxes

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

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

A pull box extension must be made of the same material as the pull box. The extension may be another pull box if the bottom edge of the pull box fits into the opening for the cover.

The bolts, nuts, and washers must be a captive design and galvanized. Captive bolts for securing the cover of nontraffic pull boxes must be capable of withstanding a torque from 55 to 60 ft-lb and a minimum pull-out strength of 750 lb.

#### 86-1.02C(3) Traffic Pull Boxes

A traffic pull box and cover must comply with ASTM C857 for HS20-44 loading.

The frame must be anchored to the box with 2-1/4-inch-long concrete anchors with a 1/4 inch diameter. A no. 3-1/2(T) pull box must have 4 concrete anchors, one placed in each corner. No. 5(T) and no. 6(T) pull boxes must have 6 concrete anchors, one placed in each corner and one near the middle of each of the longer sides.

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

Before galvanizing a steel or cast iron cover, the manufacturer must apply the cover marking by one of the following methods:

- 1. Use a cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten the strip to the cover with 1/4-inch, flathead, stainless steel machine bolts and nuts. Peen the bolts after tightening.
- 2. Use a sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten the strip to the 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 the bolts after tightening.

The steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must be no more than 1/8 inch above the top of the cover.

86-1.02C(4) Reserved 86-1.02D Tapes 86-1.02D(1) General Reserved

#### 86-1.02D(2) Pull Tape

Pull tape must be a flat, woven, lubricated, soft-fiber, polyester tape with a minimum tensile strength of 1,800 lb. The tape must have sequential measurement markings every 3 feet.

86-1.02D(3) Reserved 86-1.02E Reserved 86-1.02F Conductors and Cables

- 86-1.02F(1) Conductors
- 86-1.02F(1)(a) General

Reserved

86-1.02F(1)(b) Reserved 86-1.02F(1)(c) Copper Conductors 86-1.02F(1)(c)(i) General

Copper wire must comply with ASTM B3 and B8.

Conductor must be clearly and permanently marked the entire length of its outer surface with:

- 1. Manufacturer's name or trademark
- 2. Insulation-type letter designation
- 3. Conductor size
- 4. Voltage
- 5. Temperature rating
- 6. Number of conductors for a cable

The minimum insulation thickness and color code requirements must comply with NEC.

A conductor must be UL listed or NRTL certified and rated for 600 V(ac).

Insulation for no. 14 to no. 4 conductors must be one of the following:

- 1. Type TW PVC under ASTM D2219
- 2. Type THW PVC
- 3. Type USE, RHH, or RHW cross-linked polyethylene

The insulation for no. 2 and larger conductors must be one of the above or THWN.

Conductors must be identified as shown in the following table:

|                           | Com                           |                                 |                     |                    |      |  |
|---------------------------|-------------------------------|---------------------------------|---------------------|--------------------|------|--|
|                           |                               |                                 |                     |                    |      |  |
|                           | Insulation color <sup>d</sup> |                                 | color <sup>d</sup>  |                    |      |  |
| Circuit                   | Signal phase or function      | Base                            | Stripe <sup>a</sup> | Band symbols       | Size |  |
|                           | 2, 6                          | Red, yel, brn                   | Blk                 | 2,6                | 14   |  |
|                           | 4,8                           | Red, yel, brn                   | Ora                 | 4, 8               | 14   |  |
| Signals                   | 1, 5                          | Red, yel, brn                   | None                | 1,5                | 14   |  |
| (vehicle) <sup>a, b</sup> | 3, 7                          | Red, yel, brn                   | Pur                 | 3, 7               | 14   |  |
|                           | Ramp meter 1                  | Ramp meter 1 Red, yel, brn None |                     | NBR                | 14   |  |
|                           | Ramp meter 2                  | Red, yel, brn                   | Blk                 | NBR                | 14   |  |
|                           | 2р, 6р                        | Red, brn                        | Blk                 | 2р, 6р             | 14   |  |
| Pedestrian                | 4p, 8p                        | Red, brn                        | Ora                 | 4p, 8p             | 14   |  |
| signals                   | 1p, 5p Red, brn None 1p, 4    |                                 | 1p, 5p              | 14                 |      |  |
|                           | Зр, 7р                        | Red, brn                        | Pur                 | 3р, 7р             | 14   |  |
|                           | 2р, 6р                        | Blu                             | Blk                 | P-2, P-6           | 14   |  |
| Pedestrian                | 4p, 8p                        | Blu                             | Ora                 | P-4, P-8           | 14   |  |
| push buttons              | 1p, 5p                        | Blu                             | None                | P-1, P-5           | 14   |  |
|                           | Зр, 7р                        | Blu                             | Pur                 | P-3, P-7           | 14   |  |
| Troffic cignal            | Ungrounded circuit            |                                 |                     |                    |      |  |
| controller                | conductor                     | Blk                             | None                | CON-1              | 6    |  |
| cabinet                   | Grounded circuit              |                                 |                     |                    |      |  |
|                           | conductor                     | Wht                             | None                | CON-2              | 6    |  |
| Highway                   | Ungrounded - line 1           | Blk                             | None                | NBR                | 14   |  |
| lighting pull box         | Ungrounded - line 2           | Red                             | None                | NBR                | 14   |  |
| to luminaire              | Grounded                      | Wht                             | None                | NBR                | 14   |  |
| Multiple                  | Ungrounded - line 1           | Blk                             | None                | ML1                | 10   |  |
| highway                   |                               |                                 |                     |                    |      |  |
| lighting                  | Ungrounded - line 2           | Red                             | None                | ML2                | 10   |  |
|                           | Ungrounded - PEU              | Bik                             | None                | C1                 | 14   |  |
| Lighting control          | Switching leg from PEU        | D. I                            | Num                 |                    |      |  |
|                           | unit or SM transformer        | Red                             | None                | 62                 | 14   |  |
|                           |                               |                                 | None                |                    | C    |  |
| Service                   | (signals)                     | ВІК                             | INONE               | NBR                | 6    |  |
|                           | Ungrounded - line 2           | Bod                             | Nono                | NDD                | o    |  |
|                           | (igning)                      |                                 | None                |                    | 10   |  |
| Sign lighting             |                               | Pod                             | None                |                    | 10   |  |
| Flaching                  |                               | Neu                             | None                | <u> </u>           | 10   |  |
| heacons                   | flasher and beacons           | Red or vel                      | None                | E-Loc <sup>c</sup> | 1/   |  |
| Deacons                   | Pedestrian push buttons       | Wht                             | Blk                 | NBR                | 14   |  |
|                           | Signals and multiple          | VVIIC                           | Dik                 |                    | 17   |  |
| Grounded                  | lighting                      | Wht                             | None                | NBR                | 10   |  |
| circuit                   | Flashing beacons and          |                                 |                     |                    | 10   |  |
| conductor                 | sian liahtina                 | Wht                             | None                | NBR                | 12   |  |
|                           | Lighting control              | Wht                             | None                | C-3                | 14   |  |
|                           | Service                       | Wht                             | None                | NBR                | 14   |  |
| Railroad                  |                               |                                 |                     |                    |      |  |
| preemption                |                               | Blk                             | None                | R                  | 14   |  |
| Spares                    |                               | Blk                             | None                | NBR                | 14   |  |

# Conductor Identification

NBR = No band required PEU=Photoelectric unit

<sup>a</sup>On overlaps, the insulation is striped for the 1st phase in the designation, e.g., phase (2+3) conductor is striped as for phase 2. <sup>b</sup>Band for overlap and special phases as required

<sup>c</sup>Flashing beacons having separate service do not require banding. <sup>d</sup>Color Code: Yel-Yellow, Brn-Brown, Blu-Blue, Blk-Black, Wht-White, Ora-Orange, Pur-Purple

The insulation color must be homogeneous throughout the full depth of the insulation. The identification stripe must be continuous throughout the length of the conductor.

#### 86-1.02F(1)(c)(ii) Bonding Jumpers and Equipment Grounding Conductors

A bonding jumper must be copper wire or copper braid of the same cross-sectional area as a no. 8 conductor or larger.

An equipment grounding conductor may be bare or insulated.

#### 86-1.02F(1)(c)(iii) Inductive Loop Conductors

Inductive loop conductor must comply with the requirements shown in the following table:

#### Conductor Requirements for Inductive Loop Detectors

| Loop wire | Requirement                                                                                                                                                                                                                                                                                      |  |  |  |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Type 1    | Type RHW-USE neoprene-jacketed or Type USE cross-linked polyethylene, insulated, no. 12, stranded copper wire with a minimum 40-mils insulation thickness at any point.                                                                                                                          |  |  |  |
| Type 2    | Type THWN or Type XHHW, no. 14, stranded copper wire in a plastic tubing. The plastic tubing must be polyethylene or vinyl rated for use at 105 °C and resistant to oil and gasoline. The outside diameter of the tubing must be at most 0.27 inch with a wall thickness of at least 0.028 inch. |  |  |  |

#### 86-1.02F(1)(d) Reserved

Reserved

86-1.02F(2) Cables 86-1.02F(2)(a) General

Reserved

86-1.02F(2)(b) Reserved Reserved

# 86-1.02F(2)(c) Reserved 86-1.02F(2)(d) Copper Cables 86-1.02F(2)(d)(i) General

The conductor wire size for a detector lead-in cable must comply with the requirements of ASTM B286.

Cable, except a detector lead-in cable, must be clearly and permanently marked the entire length of its outer surface with:

- 1. Manufacturer's name or trademark
- 2. Insulation-type letter designation
- 3. Conductor size
- 4. Voltage
- 5. Temperature rating
- 6. Number of conductors for a cable

#### 86-1.02F(2)(d)(ii) Conductors Signal Cables

A conductors signal cable must have a black polyethylene jacket with an inner polyester binder sheath. The cable jacket must be rated for 600 V(ac) and 75 degrees C. Filler material, if used, must be polyethylene.

The individual conductors in the cable must be solid copper complying with ASTM B286 with Type THWN insulation. The minimum thickness of insulation must comply with NEC for conductor sizes no. 14 to no.10. The minimum thickness of the nylon jacket must be 4 mils.

Cable must comply with the requirements shown in the following table:

| Cable | Conductor             | Cable jacket thickness |         | Maximum                       | Conductor color code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------|-----------------------|------------------------|---------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| туре  | quantity and<br>type  | (n<br>Average          | Minimum | outside<br>diameter<br>(inch) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3CSC  | 3 no. 14              | 44                     | 36      | 0.40                          | Blue/black, blue/orange, white/black stripe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5CSC  | 5 no. 14              | 44                     | 36      | 0.50                          | Red, yellow, brown, black, white                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9CSC  | 8 no. 14<br>1 no. 12  | 60                     | 48      | 0.65                          | No. 12 - white,<br>no. 14 - red, yellow,<br>brown, black, and<br>red/black, yellow/black,<br>brown/black, white/black<br>stripe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 12CSC | 11 no. 14<br>1 no. 12 | 60                     | 48      | 0.80                          | No. 12 - white,<br>no. 14 - red, yellow,<br>brown, red/black stripe,<br>yellow/black stripe,<br>brown/black stripe,<br>black/red stripe,<br>black/white stripe, black,<br>red/white stripe,<br>brown/white stripe                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 28CSC | 27 no. 14<br>1 no. 10 | 80                     | 64      | 0.90                          | No. 10 - white<br>no. 14 - red/black stripe,<br>yellow/black stripe,<br>brown/black stripe,<br>red/orange stripe,<br>yellow/orange stripe,<br>brown/orange stripe,<br>red/silver stripe,<br>yellow/silver stripe,<br>red/purple stripe,<br>brown/silver stripe,<br>red/purple stripe,<br>prown/purple stripe, red/2<br>black stripes, brown/2<br>black stripes, red/2<br>orange stripes, red/2<br>orange stripes, red/2<br>silver stripes, red/2<br>silver stripes, red/2<br>silver stripes, red/2<br>silver stripes, red/2<br>silver stripes, red/2<br>purple<br>stripes, blue/black stripe,<br>blue/orange stripe,<br>blue/purple stripe,<br>white/black stripe,<br>black/red stripe, black |

#### 86-1.02F(2)(d)(iii) Detector Lead-in Cables

Conductors for a loop detector lead-in cable must be two no. 16, 19-by-29, stranded, tinned copper wires with calculated cross-sectional areas complying with ASTM B286, table 1 and must comply with the requirements shown in the following table:
#### **Conductor Requirements for Loop Detector Lead-In Cables**

| Lead-in cable | Dle Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Туре В        | Insulated with 20 mils of high-density polyethylene. Conductors must be twisted together with at least 2 turns per foot, and the twisted pair must be protected with a copper or aluminum polyester shield. A minimum no. 20 copper drain wire must be connected to the equipment ground within the cabinet. Cable must have a high-density polyethylene or high-density polypropylene outer jacket with a nominal thickness of 32 mils. Include an amorphous, interior, moisture penetration barrier of nonhydroscopic polyethylene or polypropylene fillers. |  |  |
| Туре С        | Comply with International Municipal Signal Association Specification no. 50-2. A minimum no. 20 copper drain wire must be connected to the equipment ground within the cabinet.                                                                                                                                                                                                                                                                                                                                                                                |  |  |

# 86-1.02F(2)(d)(iv) Reserved

# 86-1.02F(2)(d)(v) Signal Interconnect Cables

A signal interconnect cable must be a 6-pair type with stranded, tinned, copper no. 20 conductors. The insulation for each conductor must be color-coded polypropylene with a minimum 13-mils nominal thickness. The conductors must be in color-coded, twisted pairs. Each pair must be wrapped with an aluminum polyester shield and have a no. 22 or larger, stranded, tinned, copper drain wire inside the shielded pair.

The cable jacket must be black HDPE rated for a minimum of 300 V(ac) and 60 degrees C. The jacket must have a minimum nominal wall thickness of 40 mils.

## 86-1.02F(2)(e) Reserved

## 86-1.02G Equipment Identification Characters

Equipment identification characters must be 2-1/2 inch, series D lettering, except on wood poles, they must be 3-inch lettering.

The characters must be self-adhesive reflective labels or paint, except on wood poles, they must be embossed on aluminum.

#### 86-1.02H Splicing Materials

Splicing materials include:

- 1. Connectors
- 2. Electrical insulating coating
- 3. PVC electrical tape
- 4. Butyl rubber stretchable tape
- 5. PVC pressure-sensitive adhesive tape
- 6. Heat shrink tubing

Connectors must be C-shaped compression or butt type.

Electrical insulating coating must be a fast drying sealant with low nontoxic fumes.

PVC electrical tape must have a minimum thickness of 80 mils.

Butyl rubber stretchable tape with liner must have a minimum thickness of 120 mils.

PVC pressure-sensitive adhesive electrical tape must have a minimum thickness of 6 mils.

Electrical tapes must be self-fusing, oil- and flame-resistant, synthetic rubber and be UL listed or NRTL certified.

Heat-shrink tubing must be made of irradiated polyolefin tubing with a minimum wall thickness of 40 mils before contraction and an adhesive mastic inner wall. When heated, the inner wall must melt and fill the crevices and interstices of the covered splice area and the outer wall must shrink to form a waterproof insulation.

Heat-shrink tubing must comply with the requirements for extruded, insulating tubing at 600 V(ac) specified in UL Standard 468D and ANSI C119.1 and the requirements shown in the following table:

#### **Heat-Shrink Tubing Requirements**

| Quality characteristic                                     | Requirement                  |
|------------------------------------------------------------|------------------------------|
| Shrinkage ratio of supplied diameter <sup>a</sup> (max, %) | 33                           |
| Dielectric strength (min, kV/in)                           | 350                          |
| Resistivity (min, $\Omega$ /in)                            | 25 x 10 <sup>13</sup>        |
| Tensile strength (min, psi)                                | 2,000                        |
| Operating temperature (°C)                                 | -40–90 (135 °C in emergency) |
| Water absorption (max, %)                                  | 0.5                          |
|                                                            |                              |

<sup>a</sup>When heated to 125 °C and allowed to cool to 25 °C

#### 86-1.02I Connectors and Terminals

A connector and terminal must comply with SAE-AS7928 and be a crimp type, rated for 600 V(ac) and either UL listed or NRTL certified.

## 86-1.02J Standards, Poles, Pedestals, and Posts

Standards for signals, lighting, and flashing beacons, poles for closed circuit television, pedestals for cabinets, posts for extinguishable message sign and posts for pedestrian push button assemblies must comply with section 56-3.

## 86-1.02K Luminaires

## 86-1.02K(1) General

Luminaire must be either LED or low-pressure-sodium type.

## 86-1.02K(2) LED Luminaires

LED luminaire must be on the Authorized Material List for LED luminaires and must:

- 1. Be self-contained, not requiring assembly.
- 2. Comply with UL 1598 for luminaires in wet locations.
- 3. Have a power supply with:
  - 3.1. ANSI/IEC rating of at least IP65.
  - 3.2. 2 leads to accept standard 0-10 V(dc).
  - 3.3. Dimming control compatible with IEC 60929, Annex E. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.
  - 3.4. Case temperature self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.
- 4. Weigh no more than 35 lb.
- 5. Have a minimum operating life of 63,000 hours when operated for an average time of 11.5 hours at an average temperature of 70 degrees F.
- 6. Be designed to operate over a temperature range from -40 to 130 degrees F.
- 7. Be operationally compatible with photoelectric controls.
- 8. Have a correlated color temperature range from 3,500 to 6,500 K and a color rendering index of 65 or greater.
- 9. Have a maximum-effective projected area of 1.4 sq ft when viewed from either side or end.
- 10. Have a housing color that matches a color no. 26152 to 26440, 36231 to 36375, or 36440 of FED-STD-595.
- 11. Have an ANSI C136.41-compliant, locking-type, photocontrol receptacle with dimming connections and a watertight shorting cap.
- 12. Comply with LM-79, LM-80 and California Test 611.

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

The luminaire must be permanently marked inside the unit and outside of its packaging box. Marking consists of:

1. Manufacturer's name or trademark

- 2. Month and year of manufacture
- 3. Model, serial, and lot numbers
- 4. Rated voltage, wattage, and power in VA

An LED luminaire's onboard circuitry must include a surge protection device to withstand high-repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The device must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C64.41.2 for location category C-High. The surge protection device must comply with UL 1449 and ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

An LED luminaire and its associated onboard circuitry must comply with the Class A emission limits under 47 CFR 15(B) for the emission of electronic noise.

The fluctuations of line voltage must have no visible effect on the luminous output.

The operating voltage may range from 120 to 480 V(ac),  $60 \pm 3$  Hz. Luminaire must operate over the entire voltage range or the voltage range must be selected from one of the following:

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

LED luminaire must have a power factor of 0.90 or greater. The total harmonic distortion, current, and voltage induced into a power line by a luminaire must not exceed 20 percent. The L70 of the luminaire must be the minimum operating life or greater. Illuminance measurements must be calibrated to standard photopic calibrations.

The maximum power consumption and maintained illuminance of the LED luminaires must comply with the isofootcandle curves as shown.

LED luminaire must not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical and 2.5 percent of the rated lumens to project above 90 degrees from vertical.

Luminaire must have passive thermal management with enough capacity to ensure proper heat dissipation and functioning of the luminaire over its minimum operating life. The maximum junction temperature for the minimum operating life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans or other mechanical devices is not allowed for cooling the luminaire. The heat sink must be made of aluminum or other material of equal or lower thermal resistance. The luminaire must contain circuitry that automatically reduces the power to the LEDs so the maximum junction temperature is not exceeded when the ambient temperature is 100 degrees F or greater.

The luminaire's housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B117. All aluminum used in housings and brackets must be made of a marine-grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

The housing must be designed to prevent the buildup of water on its top surface. Exposed heat sink fins must be oriented to allow water to run off the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an UL 60529 rating of IP66. The power supply enclosure must be protected to at least an UL 60529 rating of IP43.

The housing must have a slip fitter capable of being mounted on a 2-inch-diameter pipe tenon. Slip fitter must:

- 1. Fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches
- 2. Be adjustable to a minimum of ±5 degrees from the axis of the tenon in a minimum of 5 steps: +5, +2.5, 0, -2.5, -5
- 3. Have clamping brackets that:

- 3.1. Are made of corrosion-resistant materials or treated to prevent galvanic reactions
- 3.2. Do not bottom out on the housing bosses when adjusted within the designed angular range
- 3.3. Do not permanently set in excess of 1/32 inch when tightened

Each refractor or lens must be made of UV-inhibiting high-impact plastic, such as acrylic or polycarbonate, or heat- and impact-resistant glass. The refractor or lens must be resistant to scratching. Polymeric materials, except for the lenses of enclosures containing either the power supply or electronic components of the luminaire, must be made of UL94 V-0 flame-retardant materials.

An LED luminaire and its internal components must be able to withstand mechanical shock and vibration.

If the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire's housing separately from the refractor or flat lens frame. The door must be secured to the housing to prevent accidental opening. A safety cable must mechanically connect the door to the housing.

An LED luminaire must have a barrier-type terminal block secured to the housing to connect field wires. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6.

The conductors and terminals must be identified and marked.

## 86-1.02K(3) Low-Pressure Sodium Luminaires

A low-pressure sodium luminaire must be an enclosed cutoff or semi-cutoff type and be self-contained, not requiring assembly.

The housing must be either (1) a minimum 1/16-inch-thick, corrosion-resistant, die-cast aluminum sheet and plate with concealed continuous welds or (2) a minimum 3/32-inch-thick, acrylonitrile-butadiene-styrene sheet material on a cast aluminum frame. The housing must provide mounting for all electrical components and a slip fitter. The housing must be divided into optical and power compartments that are individually accessible for service and maintenance.

The painted exterior surface of the luminaire must be finished with a fused coating of electrostatically applied polyester powder paint or other UV-inhibiting film. The color must be aluminum gray.

A sealing ring must be installed in the pipe tenon opening to prevent the entry of water and insects into the power and optical compartments. The ring must be made of high-temperature neoprene or equal material.

The power unit assembly must be accessible through a weather-tight, hinged cover secured to the housing with spring latches or captive screws.

The luminaire's hardware must be stainless steel or cadmium plated. Removable components must be secured with machine screws or bolts instead of sheet metal screws.

A semi-cutoff luminaire or a molded refractor-style cutoff luminaire must include a refractor. Other cutoff luminaires must include a flat lens. The refractor assembly and flat lens assembly must be designed to rigidly maintain their shape and be hinged and secured to the housing with spring latches.

The refractor must be either a 1-piece injection-molded polycarbonate with a minimum thickness of 3/32 inch or a 1-piece injection-molded acrylic with a minimum thickness of 1/8 inch. Alternate methods of manufacturing the refractor may be authorized provided minimum specified thicknesses are maintained.

The flat lens must be a 1-piece polycarbonate with a minimum thickness of 3/32 inch, mounted to a metal frame.

The lamp socket must be made of high-temperature, flame-retardant, thermoset material with self-wiping contacts or an equal. The socket must be rated for 660 W and 1,000 V(ac). The position of the socket and support must maintain the lamp in the correct relationship with the reflector and refractor for the designed light distribution pattern. The reflector may be an integral part of the housing.

The luminaire must comply with the isofootcandle curves as shown.

Low-pressure sodium lamp must:

1. Be a 180 W, single-ended, bayonet-base, tubular, gas-discharge lamp

- 2. Maintain a minimum of 93 percent of its initial lumens over its rated life
- 3. Reach 80 percent of its light output within 10 minutes
- 4. Restrike within 1 minute after a power outage or voltage drop at the lamp socket
- 5. Have ANSI L74/E designation

The lamp operating position must be at  $\pm 20$  degrees from the horizontal.

Lamp must comply with the minimum performance requirements shown in the following table:

| Quality characteristic               | Requirement |  |  |
|--------------------------------------|-------------|--|--|
| Initial lumens (Im)                  | 33,000      |  |  |
| Rated average life at 10 h/start (h) | 18,000      |  |  |

#### Minimum Performance Requirements

The low-pressure sodium lamp ballast must be an autotransformer or high-reactance type. The power factor must be not less than 90 percent when the ballast is operated at the nominal line voltage with a nominally-rated reference lamp. The lamp wattage regulation spread must not vary by more than  $\pm 6$  percent for  $\pm 10$  percent input voltage variation from nominal through life.

At the line voltage, the ballast must have a lamp current crest factor not exceeding 1.8 and ballast loss not exceeding 24 percent for a 180 W ballast.

The ballast must include a multi-circuit connector for quick disconnection.

#### 86-1.02K(4) Reserved

#### 86-1.02L Reserved

#### 86-1.02M Photoelectric Controls

Photoelectric control types are as shown in the following table:

| Photoelectric Control Types |                                                                                      |  |  |  |  |  |
|-----------------------------|--------------------------------------------------------------------------------------|--|--|--|--|--|
| Control type                | Description                                                                          |  |  |  |  |  |
|                             | Pole-mounted photoelectric unit. Test switch housed in an enclosure.                 |  |  |  |  |  |
| II                          | II Pole-mounted photoelectric unit. Contactor and test switch located in a service   |  |  |  |  |  |
|                             | equipment enclosure.                                                                 |  |  |  |  |  |
| III                         | Pole-mounted photoelectric unit. Contactor and a test switch housed in an enclosure. |  |  |  |  |  |
| IV                          | A photoelectric unit that plugs into a NEMA twist-lock receptacle, integral with the |  |  |  |  |  |
|                             | luminaire.                                                                           |  |  |  |  |  |
| V                           | A photoelectric unit, contactor, and test switch located in a service equipment      |  |  |  |  |  |
|                             | enclosure.                                                                           |  |  |  |  |  |

The pole-mounted adaptor for Type I, II, and III photoelectric controls must include a terminal block and cable supports or clamps to support the wires.

The enclosure for Type I and III photoelectric controls must be a NEMA 3R type. The enclosure must have a factory-applied, rust-resistant prime coat and finish coat. The enclosure must be hot-dip galvanized or painted to match the color of the lighting standard.

Photoelectric unit must:

- 1. Have a screen to prevent artificial light from causing cycling.
- 2. Have a rating of 60 Hz, 105-130 V(ac), 210-240 V(ac), or 105-240 V(ac).
- 3. Operate at a temperature range from -20 to 55 degrees C.
- 4. Consume less than 10 W.
- 5. Be a 3-prong, twist-lock type with a NEMA IP 65 rating, ANSI C136.10-compliant
- 6. Have a fail-on state
- 7. Fit into a NEMA-type receptacle
- 8. Turn on from 1 to 5 footcandles and turn off from 1.5 to 5 times the turn-on level. Measurements must be made by procedures in *EEI-NEMA Standards for Physical and Electrical Interchangeability of Light-Sensitive Control Devices Used in the Control of Roadway Lighting.*

Type I, II, III, and V photoelectric controls must have a test switch to allow manual operation of the lighting circuit. Switch must be:

- 1. Single-hole mounting, toggle type
- 2. Single pole and single throw
- 3. Labeled Auto-Test on a nameplate

Photoelectric control's contactor must be:

- 1. Normally open
- 2. Mechanical-armature type with contacts of fine silver, silver alloy, or equal or better material
- 3. Installed to provide a minimum space of 2-1/2 inches between the contactor terminals and the enclosure's sides

The terminal blocks must be rated at 25 A, 600 V(ac), molded from phenolic or nylon material, and be the barrier type with plated-brass screw terminals and integral marking strips.

#### 86-1.02N Fused Splice Connectors

The fused splice connector for 240 and 480 V(ac) circuits must simultaneously disconnect both ungrounded conductors. The connector must not have exposed metal parts except for the head of the stainless steel assembly screw. The head of the assembly screw must be recessed a minimum of 1/32 inch below the top of the plastic boss that surrounds the head.

The connector must protect the fuse from water or weather damage. Contact between the fuse and fuse holder must be spring loaded.

Fuses must:

- 1. Be standard, midget, ferrule type
- 2. Have a nontime-delay feature
- 3. Be 3/32 by 1-1/2 inches

#### 86-1.020 Grounding Electrodes

Grounding electrode must be:

- 1. 1 piece
- 2. Minimum 10-foot length of one of the following:
  - 2.1. Galvanized steel rod or pipe not less than 3/4 inch in diameter
  - 2.2. Copper clad steel rod not less than 5/8 inch in diameter

## 86-1.02P Enclosures

#### 86-1.02P(1) General

The enclosures must be rated NEMA 3R and include a dead front panel and a hasp with a 7/16-inchdiameter hole for a padlock.

The enclosure's machine screws and bolts must not protrude outside the cabinet wall.

The fasteners on the exterior of an enclosure must be vandal resistant and not be removable. The exterior screws, nuts, bolts, and washers must be stainless steel.

#### 86-1.02P(2) Service Equipment Enclosures

A service equipment enclosure must be factory wired and manufactured from steel and galvanized or have factory-applied, rust-resistant prime and finish coats, except Types II and III.

Type II and III service equipment enclosures must:

- 1. Be made of 0.125-inch minimum thickness 5052-H32 aluminum sheet complying with ASTM B209.
- 2. Be manufactured using gas metal arc welding with bare aluminum welding electrodes. The electrodes must comply with AWS A5.10 Class ER5356.

- 3. Be manufactured using welding procedures, welders, and welding operators that comply with the requirements for welding procedures, welders, and welding operators in in AWS B2.1, "Specification for Welding Procedure and Performance Qualification."
- 4. Have full-seal weld exterior seams.
- 5. Exterior welds must be ground smooth and edges filed to a radius of at least 0.03 inch.
- Have a surface finish that complies with MIL-A-8625 for a Type II, Class I coating, except the anodic coating must have a minimum thickness of 0.0007 inch and a minimum coating weight of 0.001 oz/sq in.

If a Type III enclosure houses a transformer of more than 1 kVA, the enclosure must have effective screened ventilation louvers of no less than 50 sq. in for each louver. The framed screen must be stainless no. 304 with a no. 10 size mesh and secured with at least 4 bolts.

The dead front panel on a Type III service equipment enclosure must have a continuous stainless steel or aluminum piano hinge. The panel must be secured with a latch or captive screws. No live part must be mounted on the panel.

The enclosure must be watertight and marked as specified in NEC to warn of potential electric-arc flash hazards.

Internal conductors for the photoelectric control unit must be 600 V(ac), 14 AWG (THHN) stranded machine tool wire. Where subject to flexing, 19 stranded wire must be used.

The meter area must be have a sealable, lockable, weather-tight cover that can be removed without the use of tools.

For Type III-A, III-B, and III-C enclosures, the meter socket must be a 5-clip type, and the landing lug must be suitable for multiple conductors.

For a Type III-D enclosure, the meter socket must be a 7-clip type, and the landing lug must be suitable for multiple conductors. The pedestal must comply with the Electric Utility Service Equipment Requirements Committee drawing no. 308 or 309.

Landing lugs must be (1) sized for the incoming service utility conductors, (2) compatible with either copper or aluminum conductors, and (3) made of copper or tin-plated aluminum. Live parts of the electrical equipment must be guarded against accidental contact.

The main and neutral busses of the enclosure must be made of tin-plated copper, be rated for 125 A, and be suitable for copper or aluminum conductors.

Each service equipment enclosure must have up to 2 main circuit breakers that will simultaneously disconnect ungrounded service-entrance conductors.

Circuit breaker for a service equipment enclosure must:

- 1. Be quick-break on either automatic or manual operation
- 2. Be trip indicating
- 3. Be internal-trip type
- 4. Be UL listed or NRTL certified and comply with UL 489 or equal
- 5. Be clearly marked with the frame size
- 6. Have an operating mechanism that is enclosed and trip-free from the operating handle on overload
- 7. Have the trip rating clearly marked on the operating handle
- 8. Have an interior made of copper

Circuit breakers used as disconnects must have a minimum interrupting capacity of 10,000 A, rms.

The interior of the enclosure must accept plug-in circuit breakers. A minimum of 6 standard single-pole circuit breakers, 3/4" nominal, must be provided for branch circuits.

Identify each circuit breaker and component by description using an engraved phenolic nameplate attached with stainless steel rivets or screws.

Nameplate must be installed:

- 1. Adjacent to the breaker on the dead front panel. The characters must be a minimum of 1/8 inch high.
- 2. Adjacent to the component on the back panel. The characters must be a minimum of 1/8 inch high.
- 3. At the top exterior of the door panel. The nameplate must include the system number, voltage, and number of phases engraved in minimum 3/16-inch-high characters.

A plastic-laminated wiring diagram must be attached inside the enclosure with brass eyelets by a ULlisted or NRTL-certified method.

#### 86-1.02P(3) Lighting and Sign Illumination Enclosures

A lighting and sign illumination enclosure must be manufactured from steel and either galvanized, cadmium plated, or powder coated.

#### 86-1.02Q Cabinets

#### 86-1.02Q(1) General

Cabinets must be factory wired except for battery backup system cabinets.

The fasteners on the exterior of a cabinet, except for battery backup system cabinets, must be removable and vandal resistant. The exterior screws, nuts, bolts, and washers must be stainless steel.

Terminal blocks, circuit breakers, and a power supply must be UL approved.

#### 86-1.02Q(2) Department-Furnished Controller Cabinets

A Department-furnished controller assembly consists of a Model 170E or 2070E controller unit, a wired controller cabinet, and all auxiliary equipment required to operate the system. The Department does not furnish anchor bolts.

#### 86-1.02Q(3) Controller Cabinets

The controller cabinet must be a Model 334L, comply with TEES, and be on the Authorized Material List for traffic signal control equipment. The cabinet must have 3 drawer shelves. Each shelf must be attached to the tops of 2 supporting angles with 4 screws.

#### 86-1.02Q(4) Telephone Demarcation Cabinets

#### 86-1.02Q(4)(a) General

The doors of a telephone demarcation cabinet must be attached using continuous stainless steel piano hinges.

#### 86-1.02Q(4)(b) Type A Telephone Demarcation Cabinets

Reserved

#### 86-1.02Q(4)(c) Type B Telephone Demarcation Cabinets

A Type B telephone demarcation cabinet consists of a mounting panel, outlets, circuit breaker, fan, dead front plates, and fuse.

The mounting panel must be made of 3/4-inch-thick ACX-grade plywood.

The mounting panel must be fastened to the cabinet with nuts, lock washers, and flat washers to 10 welded studs.

The cabinet must be made of 0.125-inch-thick anodized aluminum.

The cabinet door must be hung and secured with drawn latches, lockable with a padlock. The padlock latches must each have a minimum 7/16-inch-diameter hole.

Ventilation louvers must be located on the door.

The fan must be located in a ventilator housing and be controlled thermostatically. The thermostat control must have a range from 80 to 130 degrees F.

The thermostat and fan circuit must be protected with a fuse rated for 175 percent of the motor capacity. The fan capacity must be a minimum 25 cfm.

# 86-1.02Q(4)(d) Type C Telephone Demarcation Cabinets

Reserved

# 86-1.02Q(5) Battery Backup System Cabinets

The cabinet for a battery backup system must comply with TEES and be on the Authorized Material List for traffic signal control equipment.

## 86-1.02R Signal Heads

## 86-1.02R(1) General

A signal head consists of a signal mounting assembly, backplate, and signal face.

The head must have a terminal block attached to the back of one housing. The terminal block must have enough positions to accommodate all indications. Each position must be permanently labeled for the indications used.

The metal signal heads must not fracture or deflect more than half the lens diameter when tested under California Test 666.

The plastic signal heads must not fracture or deflect when tested under California Test 605.

The deflection must not be more than 10 degrees in either the vertical or horizontal plane after the wind load has been removed from the front of the signal face or more than 6 degrees in either the vertical or horizontal plane after the wind load has been removed from the back of the signal face.

## 86-1.02R(2) Signal Mounting Assemblies

Signal mounting assembly must include:

- 1. 1-1/2-inch-diameter steel pipe or galvanized conduit
- 2. Pipe fitting made of ductile iron, galvanized steel, bronze, or aluminum alloy, Type AC-84B, no. 380
- 3. Mast arm and post-top slip fitters and terminal compartments made of cast bronze or hot-dip galvanized ductile iron

The horizontal distance between the vertical centerlines of the terminal compartment or slip fitter and of each signal face must not exceed 11 inches except where required for proper signal face alignment or to allow programming of programmed visibility signal sections.

The mounting assembly must be watertight and free of sharp edges or protrusions that might damage conductor insulation. The assembly must have positive-locking serrated fittings that prevent signal faces from rotating when the fittings are mated with similar fittings on the faces.

Each terminal compartment must be fitted with a terminal block having a minimum of 12 positions, each with 2 screw-type terminals. Each terminal must accommodate at least five no. 14 conductors. The terminal compartment must have a cover for easy access to the terminal block.

# 86-1.02R(3) Backplates

The backplate material must be a homogeneous black color with a lusterless finish.

A metal backplate must be made of a minimum 1/16-inch-thick 3001-14 aluminum.

A plastic backplate must have a minimum thickness of 1/16 inch and be formed from sheet plastic or assembled from extruded, molded, or cast plastic sections. Sections must be factory joined using one of the following:

- 1. Appropriate solvent cement.
- 2. Aluminum rivets and washers painted or permanently colored to match the backplate.
- 3. No. 10 machine screws with flat washers, lock washers, and nuts painted to match the backplate.

Each plastic backplate must be secured to the plastic signal face such that it resists removal or permanent deformation.

#### 86-1.02R(4) Signal Faces

Signal face consists of signal sections with signal housings, LED modules, and visors.

Signal face must:

- 1. Be adjustable and allow for 360-degree rotation about the vertical axis
- 2. Comply with ITE publications ST-052-E, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement and ST-054, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement
- 3. Be sealed with a neoprene gasket at the top opening

A metal signal face must have a metal backplate and visor.

A plastic signal face must have a plastic backplate and visor.

If a signal face is supported by a Type MAS slip fitter, spacers are required between the 2 sections. The spacers must be made of the same material as the housing. The vertical dimension of the spacers must allow proper seating of the serrations between the slip fitter and the 2 sections. The 2 sections must be joined with at least two no. 10 minimum machine screws through holes near the front of the housing and the spacers and matching holes in a reinforcing plate installed in the housing.

# 86-1.02R(4)(a) Signal Sections

# 86-1.02R(4)(a)(i) General

Signal section must have:

- 1 Opening at the top and bottom for a 1-1/2-inch pipe
- 2. Maximum height of 10-1/4 inches for an 8-inch section and 14-3/4 inches for a 12-inch section
- Hinge pins, door-latching devices, and other exposed hardware manufactured of Type 304/304L or 305 stainless steel
- 4. Interior screws and fittings manufactured of stainless steel or steel with a corrosion-resistant plating or coating
- 5. Gaskets made of a material that is not degraded if installed in a section with metal or plastic housing

Sections must be capable of being joined together to form a signal face in any combination. This interchangeability is not required between metal and plastic sections.

Each section must be joined to an adjacent section by one of the following:

- 1. Minimum of 3 machine screws for 8-inch sections and 4 machine screws for 12-inch sections, installed through holes near the front and back of the housing. Each screw must be a no. 10 and have a nut, flat washer, and lock washer.
- 2. 2 machine screws, each with a nut, flat washer, and lock washer, installed through holes near the front of the housing and a fastener through the 1-1/2-inch pipe opening. The fastener must have 2 large, flat washers to distribute the load around the pipe's opening and 3 carriage bolts, each with a nut and lock washer. The minimum screw size must be no. 10, and the carriage bolt size must be 1/4 inch.

The holes for the machine screws must be either cast or drilled during signal section fabrication. Each hole must be surrounded by a minimum 1/8-inch-wide boss to allow contact between signal sections about the axis of the hole.

A serrated nylon washer must be inserted between each plastic signal section and the metal mounting assembly. Each serrated nylon washer must be from 3/16 to 1/4 inch thick. The serrations must match those on the signal section and the mounting assembly.

# 86-1.02R(4)(a)(ii) Programmed Visibility Signal Sections

Programmed visibility signal section must have:

- 1. Nominal 12-inch-diameter circular or arrow indication
- 2. Cap visor
- 3. Adjustable connection that:
  - 3.1. Provides incremental tilting from 0 to 10 degrees above or below the horizontal
  - 3.2. Maintains a common vertical axis through couplers and mountings

The terminal connection must allow external adjustment about the mounting axis in 5-degree increments.

The visibility of each signal section must be capable of adjustment or programming within the section.

The adjustment for the section must be preset at 4 degrees below the horizontal.

#### 86-1.02R(4)(a)(iii) Signal Housings

The signal housing must:

- 1. Be die-cast aluminum, permanent mold-cast aluminum, or if specified, structural plastic
- Comply with ITE publications ST-052-E, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement and ST-054, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement if made of die-cast or permanent mold-cast aluminum
- 3. Have a 1-piece, hinged, square-shaped door that is:
  - 3.1. Designed to allow access for replacement of modules without the use of tools
  - 3.2. Secured such that it remains closed during loading tests
- 4. Have a watertight module or lens mounted in the door
- 5. Have a terminal block attached to the back, with the terminals permanently labeled for conductors to facilitate field wiring

Each housing must have reinforcement plates. Reinforcement plates must be either sheet aluminum, galvanized steel, or cast aluminum. Each plate must have a minimum thickness of 0.11 inch and a hole concentric with a 1-1/2-inch pipe-mounting hole in the housing. Reinforcement plates must be placed as specified in the following table:

| Material         | Placement                     |
|------------------|-------------------------------|
| Sheet aluminum   | Inside and outside of housing |
| Galvanized steel | Inside of housing             |
| Cast aluminum    | Outside of housing            |

## **Reinforcement Plate Placement**

Reinforcement plates placed outside of the housing must be finished to match the signal housing color and be designed to allow a proper serrated coupling between the signal face and the mounting hardware. A minimum of three no. 10 machine screws must be installed through holes in each plate and matching holes in the housing. Each screw must have a round or binder head, a nut, and a lock washer.

A metal housing must have a metal visor.

Plastic housing must:

- 1. Be molded in a single piece or fabricated from 2 or more pieces joined into a single piece
- Be a black color throughout, including the door, matching color no. 17038, 27038, or 37038 of FED-STD-595
- 3. Have UV stability
- 4. Be self-extinguishing

If reinforcing webs are used to connect the back of the housing to the top, bottom, and sides of the adjacent housing, reinforcement plates are not required.

The exterior of the housing must be painted as specified in sections 78-4.08 and 59.

#### 86-1.02R(4)(b) LED Signal Modules

An LED signal module must be on the Authorized Material List for LED traffic signal modules.

An LED signal module must comply with ITE publications ST-052-E, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement and ST-054, Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement, except:

- 1. Maximum module weight must be 4 lb
- 2. Module must be a sealed unit with:

- 2.1. 2 color-coded conductors for the power connection except lane control modules must use 3 color-coded conductors
- 2.2. Printed circuit board that complies with TEES, chapter 1, section 6
- 2.3. Lens that is:
  - 2.3.1. Convex or flat with a smooth outer surface
  - 2.3.2. Made of UV-stabilized plastic or glass
- 2.4. 1-piece EPDM gasket
- 3. Module must include 3-foot-long conductors with attached quick-disconnect terminals
- 4. Identification must include:
  - 4.1. Month and year of manufacture
  - 4.2. 1-inch-diameter symbol of the module type with the module color written adjacent to the symbol in 0.50-inch-high letters
- 5 LED must be the ultra-bright type rated for 100,000 hours of continuous operation
- 6. Module must have an integral power supply

Individual LEDs must be wired such that a loss or failure of 1 LED will not result in a loss of more than 5 percent of the module's light output. Failure of an individual LED in a string must not result in a loss of an entire string or other indication.

The symbol for a 12-inch U-turn section must be a 15/16-inch-wide inverted U with an arrow on the left end.

A lane control section must be a combination module with a red X and green arrow. The conductor function and color code must be as shown in the following table:

| Function    | Color |  |  |
|-------------|-------|--|--|
| Neutral     | White |  |  |
| Red X       | Red   |  |  |
| Green arrow | Brown |  |  |

## Conductor Function and Color Code

The minimum power consumption for an LED signal module must be 5 W.

The maximum power consumption for an LED signal module must be as shown in the following table:

|                       | Power consumption (W) |       |        |       |       |       |
|-----------------------|-----------------------|-------|--------|-------|-------|-------|
|                       | Red                   |       | Yellow |       | Green |       |
| туре                  | 25 °C                 | 74 °C | 25 °C  | 74 °C | 25 °C | 74 °C |
| 8-inch circular       | 8                     | 13    | 13     | 16    | 12    | 12    |
| 12-inch circular      | 11                    | 17    | 22     | 25    | 15    | 15    |
| 12-inch arrow         | 9                     | 12    | 10     | 12    | 11    | 11    |
| 12-inch U-turn        | 9                     | 12    | 10     | 12    | 11    | 11    |
| Bicycle               | 11                    | 17    | 22     | 25    | 15    | 15    |
| Programmed visibility | 11                    | 17    | 22     | 25    | 15    | 15    |
| Lane control (X)      | 9                     | 12    |        |       |       |       |
| Lane control (Arrow)  |                       |       |        |       | 11    | 11    |

#### **Maximum Power Consumption**

Red and green LED signal modules operating over a temperature range from -40 to 74 degrees C and yellow LED signal modules operating at 25 degrees C must maintain the minimum illumination values for 48 months as shown in the following tables:

|             | Intensities (cd) |        |       |         |        |       |
|-------------|------------------|--------|-------|---------|--------|-------|
|             | 8-inch           |        |       | 12-inch |        |       |
| Angle (v,h) | Red              | Yellow | Green | Red     | Yellow | Green |
| 2.5, ±2.5   | 133              | 267    | 267   | 339     | 678    | 678   |
| 2.5, ±7.5   | 97               | 194    | 194   | 251     | 501    | 501   |
| 2.5, ±12.5  | 57               | 113    | 113   | 141     | 283    | 283   |
| 2.5, ±17.5  | 25               | 48     | 48    | 77      | 154    | 154   |
| 7.5, ±2.5   | 101              | 202    | 202   | 226     | 452    | 452   |
| 7.5, ±7.5   | 89               | 178    | 178   | 202     | 404    | 404   |
| 7.5, ±12.5  | 65               | 129    | 129   | 145     | 291    | 291   |
| 7.5, ±17.5  | 41               | 81     | 81    | 89      | 178    | 178   |
| 7.5, ±22.5  | 18               | 37     | 37    | 38      | 77     | 77    |
| 7.5, ±27.5  | 10               | 20     | 20    | 16      | 32     | 32    |
| 12.5, ±2.5  | 37               | 73     | 73    | 50      | 101    | 101   |
| 12.5, ±7.5  | 32               | 65     | 65    | 48      | 97     | 97    |
| 12.5, ±12.5 | 28               | 57     | 57    | 44      | 89     | 89    |
| 12.5, ±17.5 | 20               | 41     | 41    | 34      | 69     | 69    |
| 12.5, ±22.5 | 12               | 25     | 25    | 22      | 44     | 44    |
| 12.5, ±27.5 | 9                | 16     | 16    | 16      | 32     | 32    |
| 17.5, ±2.5  | 16               | 32     | 32    | 22      | 44     | 44    |
| 17.5, ±7.5  | 14               | 28     | 28    | 22      | 44     | 44    |
| 17.5, ±12.5 | 10               | 20     | 20    | 22      | 44     | 44    |
| 17.5, ±17.5 | 9                | 16     | 16    | 22      | 44     | 44    |
| 17.5, ±22.5 | 6                | 12     | 12    | 20      | 41     | 41    |
| 17.5, ±27.5 | 4                | 9      | 9     | 16      | 32     | 32    |

**Minimum Maintained Intensities for Circular Indications** 

#### **Minimum Maintained Luminance for Indications**

| Indication type      | Luminance (fL) |        |       |  |
|----------------------|----------------|--------|-------|--|
| Indication type      | Red            | Yellow | Green |  |
| Arrow                | 1,610          | 3,210  | 3,210 |  |
| U-turn               | 1,610          | 3,210  | 3,210 |  |
| Bicycle              | 1,610          | 1,610  | 1,610 |  |
| Lane control (X)     | 1,610          |        |       |  |
| Lane control (Arrow) |                |        | 1,610 |  |

#### Minimum Maintained Luminance for Programmed Visibility Indications

|                           | Luminance (cd) |        |       |
|---------------------------|----------------|--------|-------|
| Indication type           | Red            | Yellow | Green |
| PV at angle v=2.5, h=±2.5 | 314            | 314    | 314   |

Conductors must be prewired to the terminal block.

#### 86-1.02R(4)(c) Visors and Directional Louvers

The visor must be a tunnel type.

The visor must have a downward tilt from 3 to 7 degrees with a minimum length of 9-1/2 inches for nominal 12-inch round lenses and 7 inches for nominal 8-inch round lenses.

A metal visor must be formed from minimum 0.050-inch-thick aluminum alloy sheet.

A plastic visor must be either formed from sheet plastic or blow-molded. The plastic must be a black homogeneous color with a lusterless finish. A visor must withstand a wind load applied to its side for 24

hours without permanent deformation or removal from its door when tested under California Test 605 for plastic visors and California Test 666 for metal visors.

If directional louvers are used, the louvers must fit into full-circular signal visors. Louvers must consist of one of the following:

- 1. Outside cylinder constructed of sheet steel with a minimum nominal thickness of 0.030 inch and vanes constructed of sheet steel with a minimum nominal thickness of 0.016 inch.
- 2. Outside cylinder and vanes constructed of 5052-H32 aluminum alloy of equal thickness.

## 86-1.02S Pedestrian Signal Heads

#### 86-1.02S(1) General

A pedestrian signal head consists of a pedestrian signal mounting assembly and a pedestrian signal face comprising of a pedestrian signal housing, an LED countdown pedestrian signal face module, and a front screen.

## 86-1.02S(2) Pedestrian Signal Mounting Assemblies

A pedestrian signal mounting assembly must comply with the specifications for a signal mounting assembly in section 86-1.02R, except mast arm slip fitters are not required.

## 86-1.02S(3) Pedestrian Signal Faces

## 86-1.02S(3)(a) General

Each pedestrian signal face must include a light-duty terminal block rated at 5 A and have 12 positions with no. 6-by-1/8-inch binder head screws. Each position must have 1 screw-type terminal.

The wiring and terminal block must comply with ITE publication ST-055-E, *Pedestrian Traffic Control Signal Indicators: Light Emitting Diode (LED) Signal Modules*.

## 86-1.02S(3)(b) Pedestrian Signal Housings

Pedestrian signal housing must comply with the specifications for a signal housing in 86-1.02R(4)(a)(iii), except the maximum overall dimensions must be 18-1/2 inches wide, 19 inches high, and 11-1/2 inches deep and without:

- 1. Visor
- 2. Watertight module or lens mounted in the door
- 3. Reinforcement plates

The housing must have a terminal block attached to the back. The terminal block must have enough positions to accommodate all indications. Each position must be permanently labeled for the indications used.

#### 86-1.02S(3)(c) LED Countdown Pedestrian Signal Face Modules

An LED countdown PSF module must comply with ITE publication ST-055-E, *Pedestrian Traffic Control Signal Indicators: Light Emitting Diode (LED) Signal Modules*, except the material must comply with ASTM D3935 and the module must have:

- 1. Ultra-bright-type LED rated for 100,000 hours of continuous operation.
- 2. Lot number and month and year of manufacture permanently marked on the back of the module
- 3. Prominent and permanent vertical markings for accurate indexing and orientation within the pedestrian signal housing if a specific mounting orientation is required. Markings must be a minimum of 1 inch in height and include an up arrow and the word *up* or *top*.
- 4. Circuit board complying with TEES, chapter 1, section 6.

Individual LEDs must be wired such that a loss or failure of 1 LED will not result in a loss of more than 5 percent of the module's light output. Failure of an individual LED in a string must not result in a loss of an entire string or other indication.

Each symbol must be at least 9 inches high and 5-1/4 inches wide. The 2-digit countdown timer, *Upraised Hand*, and *Walking Person* indications must be electronically isolated from each other. The 3 indications must not share a power supply or interconnect circuitry.

The module must operate over the specified ambient temperature and voltage range and be readable both day and night at distances up to the full width of the area to be crossed. Upon initial testing at 25 degrees C, the module must have at least the luminance values shown in the following table:

| PSF module symbol |                            | Luminance |  |  |  |
|-------------------|----------------------------|-----------|--|--|--|
|                   | Upraised hand and 2-       | 1,094     |  |  |  |
|                   | digit countdown timer (fL) |           |  |  |  |
|                   | Walking person (fL)        | 1,547     |  |  |  |

#### **Luminance Values**

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

| Maximum Power Consumption Requirements |          |          |  |  |  |
|----------------------------------------|----------|----------|--|--|--|
| PSF module display                     | At 24 °C | At 74 ⁰C |  |  |  |
| Upraised Hand                          | 10.0 W   | 12.0 W   |  |  |  |
| Walking Person                         | 9.0 W    | 12.0 W   |  |  |  |
| 2-digit countdown timer                | 6.0 W    | 8.0 W    |  |  |  |

# Maximum Power Consumption Requirements

# 86-1.02S(3)(d) Front Screen

Pedestrian signal face must have a front screen that is one of the following types:

- 1. 3/8-inch-thick aluminum honeycomb screen with 0.2-inch-wide cells or a 1/2-inch-thick plastic screen with 3/8-inch-wide squares with 1/16-inch wall thickness that:
  - 1.1. Is installed so it tilts downward at an angle of  $15 \pm 2$  degrees from the top and completely covers the message plate.
  - 1.2. Includes a clear front cover made of either a minimum 1/8-inch-thick acrylic plastic sheet or a minimum 1/16-inch-thick polycarbonate plastic.
  - 1.3. Is held firmly in place, including the cover, with stainless steel or aluminum clips or stainless steel metal screws.
- 2. Polycarbonate screen that:
  - 2.1. Has a nominal thickness of 1/32 inch.
  - 2.2. Is a 1-1/2-inch-deep eggcrate or Z-crate type.
  - 2.3. Is mounted in a frame constructed of aluminum alloy or polycarbonate with a minimum thickness of 0.040 inch.
  - 2.4. Is held in place with stainless steel screws.

The screen and frame of a pedestrian signal face must be made of either (1) plastic that is a flat black color or (2) anodized aluminum that is a flat black color or finished with lusterless, black, exterior-grade latex paint formulated for application to metal surfaces.

# 86-1.02T Accessible Pedestrian Signals

Accessible pedestrian signal must comply with the California MUTCD, chapter 4E, and have:

- 1. Audible speech message that plays when the push button is actuated. The message must include the name of the street to be crossed. The accessible pedestrian signal must have at least 5 audible message options.
- 2. Push button locator tone that clicks or beeps.
- 3. Feature that activates the pedestrian phase during a failure of the audible message, locator tone, or vibrotactile device.

An accessible pedestrian signal must function with the Department-furnished Model 170E/2070E controller assembly.

No part of the accessible pedestrian signal must be installed inside the controller cabinet. Power for the accessible pedestrian signal must be from the pedestrian signal housing terminal block.

The housing for the signal assembly must be made of corrosion-resistant material. Theft-proof bolts used for mounting the housing to the standard must be stainless steel with a content of 17 percent chromium and 8 percent nickel. The housing must be shaped to fit the pole's curvature.

The color of a metallic housing must match color no. 33538 of FED-STD-595.

The color of a plastic housing must match color no. 17038, 27038, or 37038 of FED-STD-595.

Accessible pedestrian signal must:

- 1. Have electronic switches, a potentiometer, or an access port for a device for controlling and programming the volume level and messaging
- 2. Be weatherproof and shockproof

Enclosure for the accessible pedestrian signal must:

- 1. Weigh less than 7 lb
- 2. Measure less than 16 by 6 by 5 inches
- 3. Have a wiring hole with a diameter not exceeding 1-1/8 inches
- 5. Have a switch for a push button
- 6. Have a vibrotactile device on the push button or on the arrow
- 7. Have an internal weatherproof speaker and microphone that senses the ambient sound level

The separation between adjacent holes used for conductors and mounting must be at least twice the diameter of the larger hole.

The speaker grills must be located on the surface of the enclosure. The speakers must not interfere with the housing or its mounting hardware.

The conductor cable between the accessible pedestrian signal assembly and the pedestrian signal head must be a 9 no. 20 conductor cable complying with MIL-W-16878D.

#### 86-1.02U Push Button Assemblies

The housing for a push button assembly must be made of die-cast aluminum, permanent mold-cast aluminum, or UV-stabilized self-extinguishing structural plastic. The plastic housing must have a color throughout that matches color no. 17038, 27038, or 37038 of FED-STD-595.

If the push button is to be attached to a pole, the housing must be shaped to fit the pole's curvature.

The assembly must be waterproof and shockproof.

The push button's switch must be a single-pole, double-throw switching unit with screw-type terminals rated 15 A at 125 V(ac).

Switch for the push button must have:

- 1. Plunger actuator and a U frame to allow recessed mounting in the push button housing
- 2. Operating force of 3.5 lb
- 3. Maximum pretravel of 5/64 inch
- 4. Minimum overtravel of 1/32 inch
- 5. Differential travel from 0.002 to 0.04 inch
- 6. Minimum 2-inch diameter actuator

## 86-1.02V Reserved

#### 86-1.02W Loop Detector Sealants

#### 86-1.02W(1) General

Sealant for filling loop detector slots must be one of the following:

- 1. Asphaltic emulsion
- 2. Elastomeric sealant
- 3. Epoxy sealant for inductive loops
- 4. Hot-melt rubberized asphalt

#### 86-1.02W(2) Asphaltic Emulsion Sealant

Asphaltic emulsion sealant must comply with the State Specification 8040-41A-15.

## 86-1.02W(3) Elastomeric Sealant

Elastomeric sealant must be a polyurethane material that cures only in the presence of moisture if used within the stated shelf life. The sealant must be suitable for use in both asphalt concrete and concrete pavement.

The cured elastomeric sealant must comply with the requirements shown in the following table:

| Quality characteristic      | Test method             | Requirement     |
|-----------------------------|-------------------------|-----------------|
| Hardness                    | ASTM D2240 <sup>a</sup> | 65–85           |
| Tensile strength (min, MPa) |                         | 3.45            |
| Elongation (min, %)         | ASTM D412               | 400             |
| Flex at -40 °C <sup>c</sup> |                         | No cracks       |
| Weathering resistance       | ASTM D822 <sup>d</sup>  | Slight chalking |
| Salt spray resistance:      |                         |                 |
| Tensile strength (min, MPa) | ASTM B117 <sup>e</sup>  | 3.45            |
| Elongation (min, %)         |                         | 400             |
| Dielectric constant (%)     | ASTM D150 <sup>†</sup>  | <25             |

# **Cured Elastomeric Sealant Requirements**

<sup>a</sup>Indentation at 25 °C and 50% relative humidity (Rex. Type A, Model 1700 only)

<sup>b</sup>Die C pulled at 508 mm/minute

<sup>c</sup>0.6-mm free film bend (180°) over 13-mm mandrel

<sup>d</sup>Weatherometer 350 h, cured 7 days at 25 °C and 50% relative humidity

<sup>e</sup>28 days at 38 °C with 5% NaCl, Die C, and pulled at 508 mm/minute)

<sup>1</sup>Change over a temperature range from -30 to 50 °C

## 86-1.02W(4) Hot-Melt Rubberized Asphalt Sealant

Hot-melt rubberized asphalt sealant must:

- 1. Be in solid form at room temperature and fluid at an application temperature range from 190 to 205 degrees C
- 2. Not produce toxic fumes
- 3. Be suitable for use in both asphalt concrete and concrete pavement
- 4. Be packaged in containers clearly marked *Detector Loop Sealant* with the manufacturer's batch and lot number.

The cured hot-melt rubberized asphalt sealant must comply with the requirements shown in the following table:

| Cured Hot-Melt Rubberized Asphalt Sealant Requirements |                                  |             |
|--------------------------------------------------------|----------------------------------|-------------|
| Quality characteristic                                 | Test method                      | Requirement |
| Cone penetration (max, 1/10 mm)                        | ASTM D5329, sec. 6 <sup>a</sup>  | 35          |
| Flow (max, mm)                                         | ASTM D5329, sec. 8 <sup>▷</sup>  | 5           |
| Resilience (min, %)                                    | ASTM D5329, sec. 12 <sup>c</sup> | 25          |
| Softening point (min, °C)                              | ASTM D36                         | 82          |
| Ductility (min, cm)                                    | ASTM D113 <sup>d</sup>           | 30          |
| Flash point, Cleveland Open Cup (min, °C)              | ASTM D92                         | 288         |
| Viscosity (Pa·s)                                       | ASTM D4402 <sup>e</sup>          | 2.5–3.5     |

<sup>a</sup>At 25 °C, 150 g, 5 s <sup>b</sup>At 60 °C <sup>c</sup>At 25 °C <sup>d</sup>At 25 °C, 5 cm/minute <sup>e</sup>Breakfield Thermosol, pp. 27 epindle, 20 rpm, 100 °C

<sup>e</sup>Brookfield Thermosel, no. 27 spindle, 20 rpm, 190 °C

# 86-1.02X Reserved

#### 86-1.02Y Transformers

A transformer must be single-phase and may be a nonsubmersible or submersible type.

A transformer must be a dry type designed for operation on a 60 Hz supply. The transformer must have a decal showing a connection diagram. The diagram must show either color coding or wire tagging with primary (H1, H2) or secondary (X1, X2) markers and the primary and secondary voltage and volt-ampere rating. A transformer must comply with the electrical requirements shown in the following table:

## **Transformer Electrical Requirements**

| Quality characteristic                                            | Requirement                   |
|-------------------------------------------------------------------|-------------------------------|
|                                                                   | 120/480, 120/240, 240/480, or |
| Railing (V(ac))                                                   | 480/120                       |
| Efficiency (%)                                                    | > 95                          |
| Secondary voltage regulation and tolerance from half load to full | ±3                            |
| load (%)                                                          |                               |

Secondary 240 and 480 V(ac) windings must be center tapped.

The transformer must withstand the application of 2,200 V(ac) from core to coils and from coil to coil for a 1-minute period when tested immediately after operation of the transformer at full load for 24 hours.

The external leads for the secondary connections must be no. 10 Type USE rated for 600 V(ac).

The transformer's leads must extend a minimum of 12 inches from the case.

The transformer's insulation must be NEMA 185 C or better.

Each transformer must:

- 1. Include metal half-shell coil protection.
- 2. Have moisture-resistant, synthetic-varnish-impregnated windings.
- 3. Be waterproof and suitable for outdoor operation.

Each submersible transformer must:

- 1. Include a handle and a hanger.
- 2. Be securely encased in a rugged, corrosion-resistant, watertight case.
- 3. Have leads that extend out through 1 or more sealed hubs.
- 4. Be manufactured to withstand a 5-day test with 12-hour on and off periods submerged in 2 feet of salt water that is 2 percent salt by weight. The operating periods must be at full load.

#### 86-1.02Z Batteries

Battery must:

- 1. Be deep-cycle, sealed, prismatic, lead-calcium-based, absorbed-glass-mat, valve-regulated, leadacid type
- 2. Be rated for 12 V
- 3. Be rated for a temperature range from -25 to 60 degrees C
- 4. Be group size 24
- 5. Be commercially available and stocked locally
- 6. Be marked with a date code, maximum recharge data, and recharge cycles
- 7. Be new and fully charged when furnished
- 8. Be free from damage or deformities
- 9. Have a carrying handle
- 10. Have 2 top-mounted, threaded-stud posts that include all washers and nuts
- 11. Include insulating rubber covers for protecting the lugs, posts, and wiring: red for the positive terminal and black for the negative terminal

If a battery is used for a battery backup system, it must accommodate 3/8-inch ring lugs of a Departmentfurnished battery harness.

#### 86-1.03 CONSTRUCTION

Not Used

#### Replace section 87 with:

04-15-16

# **87 ELECTRICAL SYSTEMS**

04-15-16

# 87-1 GENERAL

# 87-1.01 GENERAL

## 87-1.01A Summary

Section 87 includes general specifications for constructing and installing electrical systems.

The Department deducts the cost for maintenance performed by the Department on new or portions of existing systems modified under the Contract.

#### 87-1.01B Definitions

Reserved

87-1.01C Submittals

Reserved

#### 87-1.01D Quality Assurance

87-1.01D(1) General

Reserved

#### 87-1.01D(2) Quality Control

Before shipping the material to the job site, submit to METS test samples of:

- 1. Accessible pedestrian signals
- 2. LED countdown pedestrian signal face modules
- 3. LED signal modules
- 4. LED luminaires

Submit a sample size as shown in the following table:

#### **Electrical Material Sampling**

| Contract quantity | Test sample size |
|-------------------|------------------|
| 1-8               | 1                |
| 9–15              | 2                |
| 16–25             | 3                |
| 26–90             | 5                |
| 91–150            | 8                |
| 151–280           | 13               |
| 281–500           | 20               |
| 501–1200          | 32               |

Before starting operation of an electrical system, perform a conductor test in the presence of the Engineer.

Conductor test consists of testing each conductor and the conductors in cables for:

- 1. Continuity.
- 2. Grounds.
- Insulation resistance at 500 V(dc) between the circuit and ground. The insulation resistance must be a minimum of 10 MΩ on circuits, except it must be a minimum of 100 MΩ for inductive loop detector circuits.

Start the operational test of the system on any day except Friday or the day before a holiday. The operational test for signals must start from 9:00 a.m. to 2:00 p.m. Notify the Engineer 48 hours before starting the test.

An operational test consists of a minimum of 5 business days of continuous, satisfactory operation of the system. If the system fails, correct the problem and retest the system. A shutdown of the system caused by traffic, a power interruption, or unsatisfactory performance of Department-furnished materials does not constitute discontinuity of the test.

# 87-1.02 MATERIALS

Not Used

## 87-1.03 CONSTRUCTION

#### 87-1.03A General

The Engineer determines the final locations of electrical systems.

Verify the locations of electrical systems and the depths of existing detectors, conduits, and pull boxes.

Notify the Engineer before performing work on the existing system.

You may shut down the system for alteration or removal.

Where an existing Department underground facility is shown within 10 feet of any excavation, locate and field mark the facility before performing work that could damage or interfere with the existing facility.

If an existing facility is within 2 feet of an excavation, determine the exact location of the facility by excavating with hand tools before using any power-operated or power-driven excavating or boring equipment. A vacuum excavator may be used if authorized.

Notify the Engineer immediately if an existing facility is damaged by your activities.

If existing underground conduit is to be incorporated into a new system, clean it with a mandrel or cylindrical wire brush and blow it clean with compressed air.

Limit the shutdown of traffic signal systems to normal working hours. Notify the local traffic enforcement agency before shutting down the signal.

Place temporary W3-1 and R1-1 signs in each direction to direct traffic through the intersection during shutdown of the signal. Place two R1-1 signs for 2-lane approaches. The signs must comply with part 2 of the *California MUTCD*.

Cover signal faces when the system is shut down overnight. Cover temporary W3-1 and R1-1 signs when the system is turned on.

If you work on an existing lighting system and the roadway is to remain open to traffic, ensure the system is in operation by nightfall.

Replace detectors you damage within 72 hours, or the Department replaces them and deducts the cost.

Work performed on an existing system not described is change order work.

Do not use electrical power from existing highway facilities unless authorized.

Maintain a minimum 48-inch clearance for a pedestrian pathway when placing equipment.

Except for service installation or work on service equipment enclosures, do not work above ground until all materials are on hand to complete the electrical work at each location.

Bond all metal components to form a continuous grounded system as specified in NEC.

Ground metallic equipment mounted less than 8 feet above the ground surface on a wood pole.

If you damage any portion of a concrete curb, sidewalk, curb ramp, driveway, or gutter depression, replace the entire section between contraction or expansion joints under section 73.

Apply equipment identification characters.

Orient louvers, visors, and signal faces such that they are clearly visible to approaching traffic from the direction being controlled.

Test loops and the detector lead-in cable circuit for continuity, ground, and insulation resistance at the controller cabinet before connecting detector lead-in cable to the terminal block.

Perform an operational test of the systems.

Before starting the operational test for systems that impact traffic, the system must be ready for operation, and all signs, pavement delineation, and pavement markings must be in place at that location.

#### 87-1.03B Conduit Installation

#### 87-1.03B(1) General

The installation of conduit includes installing caps, bushings, and pull tape and terminating the conduit in pull boxes, foundations, poles, or a structure.

Limit the number of bends in a conduit run to no more than 360 degrees between pull points.

Use conduit to enclose conductors except where they are installed overhead or inside standards or posts.

You may use a larger size conduit than specified for the entire length between termination points. Do not use a reducing coupling.

Extend an existing conduit using the same material. Terminate conduits of different materials in a pull box.

Install 2 conduits between a controller cabinet and the adjacent pull box.

Use a minimum trade size of conduit of:

- 1. 1-1/2 inches from an electrolier to the adjacent pull box
- 2. 1 inch from a pedestrian push button post to the adjacent pull box
- 3. 2 inches from a signal standard to the adjacent pull box
- 4. 3 inches from a controller cabinet to the adjacent pull box
- 5. 2 inches from an overhead sign to the adjacent pull box
- 6. 2 inches from a service equipment enclosure to the adjacent pull box
- 7. 1-1/2 inches if unspecified

Use Type 1 conduit:

- 1. On all exposed surfaces
- 2. In concrete structures
- 3. Between a structure and the nearest pull box

Ream the ends of shop-cut and field-cut conduit to remove burrs and rough edges. Make the cuts square and true. Do not use slip joints and running threads to couple conduit. If a standard coupling cannot be used for metal-type conduit, use a threaded union coupling. Tighten the couplings for metal conduit to maintain a good electrical connection.

Cap the ends of conduit to prevent debris from entering before installing the conductors or cables. Use a plastic cap for Type 1, 2, and 5 conduits and a standard pipe cap for all other types of conduit.

For Type 1, 2, and 5 conduits, use threaded bushings and bond them using a jumper. For other types of conduit, use nonmetallic bushings.

Do not install new conduit through foundations.

Cut Type 2 conduit with pipe cutters; do not use hacksaws. Use standard conduit-threading dies for threading conduit. Tighten conduit into couplings or fittings using strap wrenches or approved groove joint pliers.

Cut Type 3 conduit with tools that do not deform the conduit. Use a solvent weld for connections.

Protect shop-cut threads from corrosion under the standards shown in the following table:

| Conduit       | Standard   |  |
|---------------|------------|--|
| Types 1 and 2 | ANSI C80.1 |  |
| Туре 5        | ANSI C80.6 |  |

## Shop-Cut Thread Corrosion Protection

Apply 2 coats of unthinned, organic zinc-rich primer to metal conduit before painting. Use a primer on the Authorized Material List for organic zinc-rich primers. Do not use aerosol cans. Do not remove shop-installed conduit couplings.

For conduits, paint:

- 1. All exposed threads
- 2. Field-cut threads, before installing conduit couplings to metal conduit
- 3. Damaged surfaces on metal conduit

If a Type 2 conduit or conduit coupling coating is damaged:

- 1. Clean the conduit or fitting and paint it with 1 coat of rubber-resin-based adhesive under the manufacturer's instructions
- 2. Wrap the damaged coating with at least 1 layer of 2-inch-wide, 20 mils-minimum-thickness, PVC tape under ASTM D1000 with a minimum tape overlap of 1/2 inch

You may repair damaged spots of 1/4 inch or less in diameter in the thermoplastic coating by painting with a brushing-type compound supplied by the conduit manufacturer.

If factory bends are not used, bend the conduit to a radius no less than 6 times its inside diameter without crimping or flattening it. Comply with the bending requirements shown in the following table:

| Туре | Requirement                                                                                                               |
|------|---------------------------------------------------------------------------------------------------------------------------|
| 1    | Use equipment and methods under the conduit manufacturer's instructions.                                                  |
| 2    | Use a standard bending tool designed for use on thermoplastic-coated conduit. The conduit must be free of burrs and pits. |
| 3    | Use equipment and methods under the conduit manufacturer's instructions. Do not expose the conduit to a direct flame.     |
| 5    | Use equipment and methods under the conduit manufacturer's instructions.                                                  |

#### **Conduit-Bending Requirements**

Install pull tape with at least 2 feet of slack in each end of the conduit that will remain empty. Attach the tape's ends to the conduit.

Install conduit terminating in a standard or pedestal from 2 to 3 inches above the foundation. Slope the conduit toward the handhole opening.

Terminate conduit installed through the bottom of a nonmetallic pull box 2 inches above the bottom and 2 inches from the wall closest to the direction of the run.

# 87-1.03B(2) Conduit Installation for Structures

#### 87-1.03B(2)(a) General

Paint exposed Type 1 conduit the same color as the structure.

Install galvanized steel hangers, steel brackets, and other fittings to support conduit in or on a wall or bridge.

## 87-1.03B(2)(b) New Structures

Seal and make watertight the conduits which lead to soffits, wall-mounted luminaires, other lights, and fixtures located below the pull box grade.

If you place a conduit through the side of a nonmetallic pull box, terminate the conduit 2 inches from the wall and 2 inches above the bottom. Slope the conduit toward the top of the box to facilitate pulling conductors.

For ease of installation and if authorized, you may use Type 4 conduit instead of Type 1 conduit for the final 2 feet of conduit entering a pull box in a reinforced concrete structure.

Install an expansion fitting where a conduit crosses an expansion joint in a structure. Each expansion fitting for metal conduit must include a copper bonding jumper having the ampacity as specified in NEC.

Install an expansion-deflection fitting for an expansion joint with a 1-1/2-inch movement rating. The fitting must be watertight and include a molded neoprene sleeve, a bonding jumper, and 2 silicon bronze or zinc-plated iron hubs.

For an expansion joint with a movement rating greater than 1-1/2 inches, install the expansion-deflection fitting as shown.

For conduit installed inside of bridge structures, you must:

- 1. Install precast concrete cradles made of minor concrete and commercial-quality welded wire fabric. The minor concrete must contain a minimum of 590 lb of cementitious material per cubic yard. The cradles must be moist cured for a minimum of 3 days.
- 2. Bond precast concrete cradles to a wall or bridge superstructure with one of the following:
  - 2.1. Epoxy adhesive for bonding freshly-mixed concrete to hardened concrete.
  - 2.2. Rapid-set epoxy adhesive for pavement markers.
  - 2.3. Standard-set epoxy adhesive for pavement markers.
- 3. Use a pipe sleeve or form an opening for a conduit through a bridge superstructure. The sleeve or opening through a prestressed member or conventionally reinforced precast member must be:
  - 3.1. Oriented transverse to the member.
  - 3.2. Located through the web.
  - 3.3. No more than 4 inches in size.
- 4. Wrap the conduit with 2 layers of asphalt felt building paper and securely tape or wire the paper in place for a conduit passing through a bridge abutment wall. Fill the space around the conduit with mortar under section 51-1, except the proportion of cementitious material to sand must be 1 to 3. Fill the space around the conduits after prestressing is completed.

Thread and cap a conduit installed for future use in structures. Mark the location of the conduit's end in a structure, curb, or wall directly above the conduit with a Y that is 3 inches tall.

## 87-1.03B(2)(c) Existing Structures

Run surface-mounted conduit straight and true, horizontal or vertical on the wall, and parallel to walls on ceilings or similar surfaces. Support the conduit at a maximum of 5-foot intervals where needed to prevent vibration or deflection. Support the conduit using galvanized, malleable-iron, conduit clamps, and clamp backs secured with expansion anchorage devices complying with section 75-3.02C. Use the largest diameter of galvanized, threaded studs that will pass through the mounting hole in the conduit clamp.

#### 87-1.03B(3) Conduit Installation Underground

#### 87-1.03B(3)(a) General

Install conduit to a depth of:

- 1. 14 inches for the trench-in-pavement method
- 2. 18 inches, minimum, under sidewalk and curbed paved median areas
- 3. 42 inches, minimum, below the bottom of the rail of railroad tracks

4. 30 inches, minimum, everywhere else below grade

Place conduit couplings at a minimum of 6 inches from the face of a foundation.

Place a minimum of 2 inches of sand bedding in a trench before installing Type 2 or Type 3 conduit and 4 inches of sand bedding over the conduit before placing additional backfill material.

If installing conduit within the limits of hazardous locations as specified in NEC for Class I, division 1, install and seal Type 1 or Type 2 conduit with explosion-proof sealing fittings.

#### 87-1.03B(3)(b) Conduit Installation under Paved Surfaces

You may lay conduit on existing pavement within a new curbed median constructed on top.

Install conduit under existing pavement by the jacking or drilling methods. You may use the trench-inpavement method for either of the following conditions:

- 1. If conduit is to be installed behind the curb under the sidewalk
- 2. If the delay to vehicles will be less than 5 minutes

Do not use the trench-in-pavement method for conduit installations under freeway lanes or freeway-tofreeway connector ramps.

# 87-1.03B(3)(c) Reserved

#### 87-1.03B(3)(d) Conduit Installation under Railroad Tracks

Install Type 1 or Type 2 conduit with a minimum diameter of 1-1/2 inches under railroad tracks. If you use the jacking or drilling method to install the conduit, construct the jacking pit a minimum of 13 feet from the tracks' centerline at the near side of the pit. Cover the jacking pit with planking if left overnight.

## 87-1.03B(4) Reserved

#### 87-1.03B(5) Conduit Installation by the Jacking or Drilling Method

Keep the jacking or drilling pit 2 feet away from the pavement's edge. Do not weaken the pavement or soften the subgrade with excessive use of water.

If an obstruction is encountered, obtain authorization to cut small holes in the pavement to locate or remove the obstruction.

You may install Type 2 or Type 3 conduit under the pavement if a hole larger than the conduit's diameter is predrilled. The predrilled hole must be less than one and half the conduit's diameter.

Remove the conduit used for drilling or jacking and install new conduit for the completed work.

#### 87-1.03B(6) Conduit Installation by the Trenching-In-Pavement Method

Install conduit by the trenching-in-pavement method using a trench approximately 2 inches wider than the conduit's outside diameter but not exceeding 6 inches in width.

Where additional pavement is to be placed, you must complete the trenching before the final pavement layer is applied.

If the conduit shown is to be installed under the sidewalk, you may install it in the street within 3 feet of and parallel to the face of the curb. Install pull boxes behind the curb.

Cut the trench using a rock-cutting excavator. Minimize the shatter outside the removal area of the trench.

Dig the trench by hand to the required depth at pull boxes.

Place conduit in the trench.

Backfill the trench with minor concrete to the pavement's surface by the end of each work day. If the trench is in asphalt concrete pavement and no additional pavement is to be placed, backfill the top 0.10 foot of the trench with minor HMA within 3 days after trenching.

# 87-1.03C Installation of Pull Boxes

## 87-1.03C(1) General

Install pull boxes no more than 200 feet apart.

You may install larger pull boxes than specified or shown and additional pull boxes to facilitate the work except in structures.

Install a pull box on a bed of crushed rock and grout it before installing conductors. The grout must be from 0.5 to 1 inch thick and sloped toward the drain hole. Place a layer of roofing paper between the grout and the crushed rock sump. Make a 1-inch drain hole through the grout at the center of the pull box.

Set the pull box such that the top is 1-1/4 inches above the surrounding grade in unpaved areas and leveled with the finished grade in sidewalks and other paved areas.

Place the cover on the box when not working in it.

Grout around conduits that are installed through the sides of the pull box.

Bond and ground the metallic conduit before installing conductors and cables in the conduit.

Bond metallic conduits in a nonmetallic pull box using bonding bushings and bonding jumpers.

Do not install pull boxes in concrete pads, curb ramps, or driveways.

Reconstruct the sump of a pull box if disturbed by your activities. If the sump was grouted, remove and replace the grout.

## 87-1.03C(2) Nontraffic Pull Boxes

If you bury a nontraffic pull box, set the box such that the top is 6 to 8 inches below the surrounding grade. Place a 20-mil-thick plastic sheet made of HDPE or PVC virgin compounds to prevent water from entering the box.

Place mortar between a nontraffic pull box and a pull box extension.

Where a nontraffic pull box is in the vicinity of curb in an unpaved area, place the box adjacent to the back of the curb if practical.

Where a nontraffic pull box is adjacent to a post or standard, place the box within 5 feet upstream from traffic if practical.

If you replace the cover on a nontraffic pull box, anchor it to the box.

#### 87-1.03C(3) Traffic Pull Boxes

Place minor concrete around and under a traffic pull box.

Bolt the steel cover to the box when not working in it.

Bond the steel cover to the conduit with a jumper and bolt it down after installing the conductors and cables.

#### 87-1.03C(4) Structure Pull Boxes

Bond metallic conduit in a metal pull box in a structure using locknuts, inside and outside of the box, bonding bushings, and bonding jumpers connected to bonding wire running in the conduit system.

#### 87-1.03D Reserved

#### 87-1.03E Excavating and Backfilling for Electrical Systems

#### 87-1.03E(1) General

Notify the Engineer at least 72 hours before starting excavation activities.

Dispose of surplus excavated material.

Restrict closures for excavation on a street or highway to 1 lane at a time unless otherwise specified.

# 87-1.03E(2) Trenching

Dig a trench for the electrical conduits or direct burial cables. Do not excavate until the conduit or direct burial cable will be installed.

Place excavated material in a location that will not interfere with traffic or surface drainage.

After placing the conduit or direct burial cable, backfill the trench with the excavated material. Compact the backfill placed outside the hinge point of slopes and not under pavement to a minimum relative compaction of 90 percent.

Compact the backfill placed within the hinge points and in areas where pavement is to be constructed to a minimum relative compaction of 95 percent.

Restore the sidewalks, pavement, and landscaping at a location before starting excavation at another location.

#### 87-1.03E(3) Concrete Pads, Foundations, and Pedestals

Construct foundations for standards, poles, metal pedestals, and posts under section 56-3.

Construct concrete pads, foundations, and pedestals for controller cabinets, telephone demarcation cabinets, and service equipment enclosures on firm ground.

Install anchor bolts using a template to provide proper spacing and alignment. Moisten the forms and ground before placing the concrete. Keep the forms in place until the concrete sets for at least 24 hours to prevent damage to the surface.

Use minor concrete for pads, foundations, and pedestals.

In unpaved areas, place the top of the foundation 6 inches above the surrounding grade, except place the top:

- 1. 1 foot 6 inches above the grade for Type M and 336L cabinets
- 2. 1 foot 8 inches above the grade for Type C telephone demarcation cabinets
- 3. 2 inches above the grade for Type G and Type A cabinets and Type III service equipment enclosures

The pad must be 2 inches above the surrounding grade.

In and adjacent to the sidewalk and other paved areas, place the top of the foundation 4 inches above the surrounding grade, except place the top:

- 1. 1 foot 6 inches above the grade for Type M and 336L cabinets
- 2. 1 foot 8 inches above the grade for Type C telephone demarcation cabinets
- 3. Level with the finished grade for Type G and Type A cabinets and Type III service equipment enclosures

The pad must be level with the finished grade.

Apply an ordinary surface finish under section 51-1.03F.

Allow the foundation to cure for at least 7 days before installing any equipment.

#### 87-1.03F Conductors and Cable Installations

#### 87-1.03F(1) General

The installation of conductors and cables includes splicing conductors and attaching the terminals and connectors to the conductors.

Clean the conduit and pull all conductors and cables as a unit.

If new conductors or cables are to be added in an existing conduit:

- 1 Remove the content
- 2. Clean the conduit
- 3. Pull both old and new conductors and cables as a unit

Wrap conductors and secure cables to the end of the conduit in a pull box.

Seal the ends of conduits with a sealing compound after installing conductors or cables.

Neatly arrange conductors and cables inside pull boxes and cabinets. Tie the conductors and cables together with self-clinching nylon cable ties or enclose them in a plastic tubing or raceway.

Identify conductors and cables by direct labeling, tags, or bands fastened in such a way that they will not move. Use mechanical methods for labeling.

Provide band symbol identification on each conductor or each group of conductors comprising a signal phase in each pull box and near the end of terminated conductors.

Tape the ends of unused conductors and cables in pull boxes to form a watertight seal.

Do not connect the push-button or accessible pedestrian signal neutral conductor to the signal neutral conductor.

87-1.03F(2) Cables 87-1.03F(2)(a) General Reserved 87-1.03F(2)(b) Reserved 87-1.03F(2)(c) Copper Cables 87-1.03F(2)(c)(i) General

Reserved

#### 87-1.03F(2)(c)(ii) Detector Lead-in Cables

Install a Type B or C detector lead-in cable in conduit.

Waterproof the ends of the lead-in cable before installing it in the conduit to prevent moisture from entering the cable.

Splice loop conductors for each direction of travel for the same phase, terminating in the same pull box, to a separate lead-in cable running from the pull box adjacent to the loop detector to a sensor unit mounted in the controller cabinet. Install the lead-in cable without splices except at the pull box.

Verify in the presence of the Engineer that the loops are operational before making the final splices between loop conductors and the lead-in cable.

Identify and tag each lead-in cable with the detector designation at the cabinet and pull box adjacent to the loops.

#### 87-1.03F(2)(c)(iii) Conductors Signal Cables

Do not splice signal cables except for a 28-conductor cable.

Provide identification at the ends of terminated conductors in a cable as shown.

Provide identification for each cable in each pull box showing the signal standard to which it is connected except for the 28-conductor cable.

Connect conductors in a 12-conductor cable as shown in the following table:

| Color code          | Termination                                  | Phase         |
|---------------------|----------------------------------------------|---------------|
| Red                 | Red signal                                   | 2, 4, 6, or 8 |
| Yellow              | Yellow signal                                | 2, 4, 6, or 8 |
| Brown               | Green signal                                 | 2, 4, 6, or 8 |
| Red/black stripe    | Red signal                                   | 1, 3, 5, or 7 |
| Yellow/black stripe | Yellow signal                                | 1, 3, 5, or 7 |
| Brown/black stripe  | Green signal                                 | 1, 3, 5, or 7 |
| Black/red stripe    | Spare or as required for red or DONT<br>WALK |               |
| Black/white stripe  | Spare or as required for yellow              |               |
| Black               | Spare or as required for green or WALK       |               |
| Red/white stripe    | Pedestrian signal DONT WALK                  |               |
| Brown/white stripe  | Pedestrian signal WALK                       |               |
| White               | Terminal block                               | Neutral       |

## **12CSC Color Code and Functional Connection**

Provide identification for each 28-conductor cable C1 or C2 in each pull box. The cable labeled *C1* must be used for signal phases 1, 2, 3, and 4. The cable labeled *C2* must be used for signal phases 5, 6, 7, and 8.

Connect conductors in a 28-conductor cable as shown in the following table:

| Color code             | Termination                   | Phase                               |
|------------------------|-------------------------------|-------------------------------------|
| Red/black stripe       | Red signal                    | 2 or 6                              |
| Yellow/black stripe    | Yellow signal                 | 2 or 6                              |
| Brown/black stripe     | Green signal                  | 2 or 6                              |
| Red/orange stripe      | Red signal                    | 4 or 8                              |
| Yellow/orange stripe   | Yellow signal                 | 4 or 8                              |
| Brown/orange stripe    | Green signal                  | 4 or 8                              |
| Red/silver stripe      | Red signal                    | 1 or 5                              |
| Yellow/silver stripe   | Yellow signal                 | 1 or 5                              |
| Brown/silver stripe    | Green signal                  | 1 or 5                              |
| Red/purple stripe      | Red signal                    | 3 or 7                              |
| Yellow/purple stripe   | Yellow signal                 | 3 or 7                              |
| Brown/purple stripe    | Green signal                  | 3 or 7                              |
| Red/2 black stripes    | Pedestrian signal DONT WALK   | 2 or 6                              |
| Brown/2 black stripes  | Pedestrian signal WALK        | 2 or 6                              |
| Red/2 orange stripes   | Pedestrian signal DONT WALK   | 4 or 8                              |
| Brown/2 orange stripes | Pedestrian signal WALK        | 4 or 8                              |
| Red/2 silver stripes   | Overlap A, C                  | OLA <sup>a</sup> ,                  |
|                        |                               | OLC <sup>a</sup>                    |
| Brown/2 silver stripes | Overlap A, C                  | OLA <sup>c</sup> , OLC <sup>c</sup> |
| Red/2 purple stripes   | Overlap B, D                  | OLB <sup>a</sup> ,                  |
|                        |                               | OLD <sup>a</sup>                    |
| Brown/2 purple stripes | Overlap B, D                  | OLB <sup>c</sup> , OLD <sup>c</sup> |
| Blue/black stripe      | Pedestrian push button        | 2 or 6                              |
| Blue/orange stripe     | Pedestrian push button        | 4 or 8                              |
| Blue/silver stripe     | Overlap A, C                  | OLA <sup>⁵</sup> ,                  |
|                        |                               | OLC <sup>▷</sup>                    |
| Blue/purple stripe     | Overlap B, D                  | OLB⁵,                               |
|                        |                               | OLD <sup>▷</sup>                    |
| White/black stripe     | Pedestrian push button common |                                     |
| Black/red stripe       | Railroad preemption           |                                     |
| Black                  | Spare                         |                                     |
| White                  | Terminal block                | Neutral                             |

**28CSC Color Code and Functional Connection** 

OL = Overlap; A, B, C, and D = Overlapping phase designation

<sup>a</sup>For red phase designation

<sup>b</sup>For yellow phase designation

<sup>c</sup>For green phase designation

Use the neutral conductor only with the phases associated with that cable. Do not intermix neutral conductors from different cables except at the signal controller.

# 87-1.03F(2)(c)(iv) Signal Interconnect Cable

For a signal interconnect cable, provide a minimum of 6 feet of slack inside each controller cabinet.

Do not splice the cable unless authorized.

If splices are authorized, insulate the conductor splices with heat-shrink tubing and overlap the insulation at least 0.6 inch. Cover the splice area of the cable with heat-shrink tubing and overlap the cable jacket at least 1-1/2 inches. Provide a minimum of 3 feet of slack at each splice.

## 87-1.03F(3) Conductors

#### 87-1.03F(3)(a) General

Do not run conductors to a terminal block on a standard unless they are to be connected to a signal head mounted on that standard.

Provide 3 spare conductors in all conduits containing ramp metering and traffic signal conductors.

Install a separate conductor for each terminal of a push button assembly and accessible pedestrian signal.

Provide conductor slack to comply with the requirements shown in the following table:

| Location                     | Slack (feet) |
|------------------------------|--------------|
| Signal standard              | 1            |
| Lighting standard            | 1            |
| Signal and lighting standard | 1            |
| Pull box                     | 3            |
| Splice                       | 3            |
| Standards with slip base     | 0            |

## **Conductor Slack Requirements**

# 87-1.03F(3)(b) Reserved

# 87-1.03F(3)(c) Copper Conductors

## 87-1.03F(3)(c)(i) General

Install a minimum no. 8, insulated, grounding copper conductor in conduit and connect it to all-metal components.

Where conductors from different service points occupy the same conduit or standard, enclose the conductors from one of the services in flexible or rigid metal conduit.

## 87-1.03F(3)(c)(ii) Inductive Loop Conductors

Install a Type 1 or 2 inductive loop conductor except use Type 2 for Type E loop detectors.

Install the conductor without splices except at the pull box.

## 87-1.03F(4) Manual Installation Method

Use an inert lubricant for placing conductors and cables in conduit.

Pull the conductors and cables into the conduit by hand using pull tape.

#### 87-1.03G Equipment Identification Characters

The Engineer provides you with a list of the equipment identification characters.

Stencil the characters or apply the reflective self-adhesive labels to a clean surface.

Treat the edges of self-adhesive characters with an edge sealant.

Place the characters on the side facing traffic on:

- 1. Front doors of cabinets and service equipment enclosures.
- 2. Wood poles, fastened with 1-1/4-inch aluminum nails, for pole mounted enclosures
- 3. Adjacent bent or abutment at approximately the same station as an illuminated sign or soffit luminaire
- 4. Underside of the structure adjacent to the illuminated sign or soffit luminaire if no bent or abutment exists nearby
- 5. Posts of overhead signs
- 6. Standards

Before placing new characters on existing or relocated equipment, remove the existing characters.

## 87-1.03H Conductor and Cables Splices

#### 87-1.03H(1) General

You may splice:

- 1. Grounded conductors in a pull box
- 2. Accessible pedestrian signal and push bottom conductors in a pull box
- 3. Ungrounded signal conductors in a pull box if signals are modified

- 4. Ungrounded signal conductors to a terminal compartment or a signal head on a standard with conductors of the same phase in the pull box adjacent to the standard
- 5. Ungrounded lighting circuit conductors in a pull box if lighting circuits are modified

Solder all splices using the hot iron, pouring, or dipping method. Do not perform open-flame soldering.

#### 87-1.03H(2) Splice Insulation Methods

Insulate splices in a multiconductor cable to form a watertight joint and to prevent moisture absorption by the cable.

Use heat-shrink tubing or Method B to insulate a splice.

Use heat-shrink tubing as follows:

- 1. Cover the splice area completely with an electrical insulating coating and allow it to dry.
- 2. Place mastic around each conductor before placing them inside the tubing. Use the type of mastic specified in the tubing manufacturer's instructions.
- 3. Heat the area under the manufacturer's instructions. Do not perform open-flame heating. After contraction, each end of the heat-shrink tubing or the open end of the tubing's end cap must overlap the conductor insulation at least 1-1/2 inches.
- 4. Cover the entire splice with an electrical insulating coating and allow it to dry.

Use Method B as follows:

- 1. Cover the splice area completely with an electrical insulating coating and allow it to dry.
- 2. Apply 3 layers of half-lapped, 80-mils, PVC tape.
- 3. Apply 2 layers of 120-mils, butyl-rubber, stretchable tape with liner.
- 4. Apply 3 layers of half-lapped, 6-mils, PVC, pressure-sensitive, adhesive tape.
- 5. Cover the entire splice with an electrical insulating coating and allow it to dry.

#### 87-1.03I Connectors and Terminals

Apply connectors and terminals to cables and conductors using a crimping compression tool under the manufacturer's instructions. The tool must prevent opening of the handles until the crimp is completed.

Install crimp-style terminal lugs on stranded conductors smaller than no. 14.

Solder no. 8 and smaller conductors to connectors and terminal lugs.

#### 87-1.03J Standards, Poles, Pedestals, and Posts

Install standards, poles, pedestals, and posts under section 56-3.

Ground standards with a handhole by attaching a bonding jumper from the bolt or lug inside the standard to a metal conduit or to the grounding wire in the adjacent pull box. The bonding jumper must be visible when the handhole cover is removed.

Ground standards without a handhole or standards with a slip base by attaching a bonding jumper to all anchor bolts using ground clamps and connecting it to a metal conduit or to the grounding wire in the adjacent pull box. The bonding jumper must be visible after mortar has been placed on the foundation.

#### 87-1.03K Reserved

# 87-1.03L Utility Service

#### 87-1.03L(1) General

Install the service equipment early enough to allow the utility to complete its work before completion of the electrical work.

At least 15 days before permanent electrical and telecommunication service is required, request the service connections for permanent installations. The Department arranges with the utilities for completion of the connections and pays all costs and fees required by the utilities.

# 87-1.03L(2) Electric Service

## 87-1.03L(2)(a) General

If service equipment is to be installed on a utility-owned pole, furnish and install the conduit, conductors, pull boxes, and other necessary material to complete the service installation. The service utility decides the position of the riser and equipment on the pole.

# 87-1.03L(2)(b) Electric Service for Irrigation

Establishing electric service for irrigation includes installing conduit, conductors, and pull boxes and making connections from the service point to the irrigation controllers.

## 87-1.03L(2)(c) Electric Service for Booster Pumps

Establishing electric service for a booster pump includes installing conduit, conductors, and pull boxes and making connections from the service point to the booster pump enclosure.

# 87-1.03L(3) Telecommunications Service

Establishing telecommunication service includes installing conduit, conductors, and pull boxes and making connections from the service point to the telephone demarcation cabinet.

## 87-1.03M Photoelectric Controls

Mount the photoelectric unit on the top of the pole for Type I, II, and III photoelectric controls. Use mounting brackets where pole-top mounting is not possible. Orient the photoelectric unit to face north.

Mount the enclosure at a height of 6 feet above finished grade on the same standard as the photoelectric unit.

Install a minimum 100 VA, 480/120 V(ac) transformer in the contactor enclosure to provide 120 V(ac) for the photoelectric control unit when switching 480 V(ac), 60 Hz circuits.

## 87-1.03N Fused Splice Connectors

Install a fuse splice connector in each ungrounded conductor for luminaires mounted on standards. The connector must be located in the pull box adjacent to the standard.

Crimp the connector terminals onto the ungrounded conductors using a tool under the manufacturer's instructions. Insulate the terminals and make them watertight.

#### 87-1.030 Grounding Electrodes

Install a grounding electrode for each cabinet, service equipment enclosure, and transformer.

Attach a grounding conductor from the electrode using either a ground clamp or exothermic weld. Connect the other end of the conductor to the cabinet, service equipment enclosure, and transformer.

#### 87-1.03P Service Equipment Enclosures

Installing a service equipment enclosure includes constructing the foundation and pad and installing conduit, adjacent pull boxes, and grounding electrode.

Locate the foundation such that the minimum clearance around the front and back of the enclosure complies with NEC, article 110.26, "Spaces About Electrical Equipment, (600 V, nominal or less)."

Bond and ground metal conduit as specified in NEC and by the service utility except the grounding electrode conductor must be no. 6 or larger.

If circuit breakers and components do not have a description on engraved phenolic nameplates, install them using stainless steel rivets or screws under section 86-1.02P(2).

#### 87-1.03Q Cabinets

#### 87-1.03Q(1) General

Installing a cabinet includes constructing the foundation and pad and installing conduit, adjacent pull boxes, and grounding electrode.

Apply a mastic or caulking compound before installing the cabinet on the foundation to seal the openings.

Connect the field wiring to the terminal blocks in the cabinet. Neatly arrange and lace or enclose the conductors in plastic tubing or raceway. Terminate the conductors with properly sized captive or spring spade terminals. Apply a crimp-style connector and solder them.

Install and solder a spade-type terminal on no. 12 and smaller field conductors and a spade-type or ringtype terminal on conductors larger than no. 12.

## 87-1.03Q(2) Department-Furnished Controller Cabinets

Arrange for the delivery of Department-furnished controller cabinets.

#### 87-1.03Q(3) Reserved

#### 87-1.03Q(4) Telephone Demarcation Cabinets

Installing a telephone demarcation cabinet includes installing conduit, cable, and pull boxes to the controller cabinet.

Install the cabinet with the back toward the nearest lane of traffic.

## 87-1.03R Signal Heads

#### 87-1.03R(1) General

Installing a signal head includes mounting the heads on standards and mast arms, installing backplates and visors, and wiring conductors to the terminal blocks.

Keep the heads covered or direct them away from traffic until the system is ready for operation.

#### 87-1.03R(2) Signal Faces

Use the same brand and material for the signal faces at each location.

Program the programmable visibility signal faces under the manufacturer's instructions. The indication must be visible only in those areas or lanes to be controlled.

#### 87-1.03R(3) Backplates

Install backplates using at least six 10-24 or 10-32 self-tapping and locking stainless steel machine screws and flat washers.

If a plastic backplate requires field assembly, attach each joint using at least four no.10 machine screws. Each machine screw must have an integral or captive flat washer, a hexagonal head slotted for a standard screwdriver, and either a locking nut with an integral or captive flat washer or a nut, flat washer, and lock washer. Machine screws, nuts, and washers must be stainless steel or steel with a zinc or black oxide finish.

If a metal backplate has 2 or more sections, fasten the sections with rivets or aluminum bolts peened after assembly to avoid loosening.

Install the backplate such that the background light is not visible between the backplate and the signal face or between sections.

#### 87-1.03R(4) Signal Mounting Assemblies

Install a signal mounting assembly such that its members are arranged symmetrically and plumb or level. Orient each mounting assembly to allow maximum horizontal clearance to the adjacent roadway.

For a bracket-mounted assembly, bolt the terminal compartment or pole plate to the pole or standard.

In addition to the terminal compartment mounting, attach the upper pipe fitting of Type SV-1-T with 5 sections or a SV-2-TD to the standard or pole using the mounting detail for signal heads without a terminal compartment.

Use a 4-1/2-inch slip fitter and set screws to mount an assembly on a post top.

After installing the assembly, clean and paint the exposed threads of the galvanized conduit brackets and bracket areas damaged by the wrench or vise jaws. Use a wire brush to clean and apply 2 coats of unthinned, organic zinc-rich primer. Do not use an aerosol can to apply the primer.

Install the conductors in the terminal compartment and secure the cover.

## 87-1.03S Pedestrian Signal Heads

Installing a pedestrian signal head includes mounting the heads on standards and wiring conductors to the terminal blocks.

Install the pedestrian signal mounting assembly under section 87-1.03R(4).

Use the same brand and material for the pedestrian signal faces at each location.

Install a pedestrian signal face such that its members are arranged symmetrically and plumb or level.

#### 87-1.03T Accessible Pedestrian Signals

Use the same brand for the accessible pedestrian signals at each location.

Install an accessible pedestrian signal and the R10 series sign on the crosswalk side of the standard.

Attach the accessible pedestrian signal to the standard with self-tapping screws.

Attach the sign to the standard using 2 straps and saddle brackets.

Point the arrow on the accessible pedestrian signal in the same direction as the corresponding crosswalk.

Furnish the equipment and hardware to set up and calibrate the accessible pedestrian signal.

Arrange to have a manufacturer's representative at the job site to program the accessible pedestrian signal with an audible message or tone.

#### 87-1.03U Push Button Assemblies

Install the push button assembly and the R10 series sign on the crosswalk side of the standard.

Attach the sign to the assembly for Type B assemblies.

Attach the sign to the standard using 2 straps and saddle brackets for Type C assemblies.

You may use straps and saddle brackets to secure the push button to the standard.

Use a slip fitter to secure the assembly on top of a 2-1/2-inch-diameter post.

# 87-1.03V Detectors

#### 87-1.03V(1) General

Installing a detector includes installing inductive loop conductors, sealant, conduit, and pull boxes.

Center the detectors in the traffic lanes.

Do not splice the detector conductor.

#### 87-1.03V(2) Inductive Loop Detectors

Mark the location of the inductive loop detectors such that the distance between the side of the loop and a lead-in saw cut from an adjacent detector is at least 2 feet. The distance between lead-in saw cuts must be at least 6 inches.

Saw cut the slots under section 13-4.03E(7). The bottoms of the slots must be smooth with no sharp edges. For Type E detector loops, saw the slots such that the sides are vertical.

Wash the slots clean using water and blow dry them with compressed air to remove all moisture and debris.

Identify the start of the conductor.

Waterproof the ends of a Type 2 loop conductor before installing it in the conduit to prevent moisture from entering the cable.

Install the loop conductor in the slots and lead-in saw cuts using a 3/16- to 1/4-inch-thick wood paddle. Hold the conductors in place at the bottom of the slot with wood paddles during placement of the sealant. Wind adjacent loops on the same sensor unit channel in opposite directions.

Twist the conductors for each loop into a pair consisting of a minimum of 2 turns per foot before placing them in the lead-in saw cut and the conduit leading to the pull box. Do not install more than 2 twisted pairs of conductors per lead-in saw cut.

Provide 5 feet of slack in the pull box.

Test each loop for continuity, circuit resistance, and insulation resistance before filling the slots with sealant.

Remove excess sealant from the adjacent road surface before it sets. Do not use solvents to remove the excess.

Identify the loop conductor pair in the pull box, marking the start with the letter *S* and the end with the letter *F*. Band conductors in pairs by lane in the pull box adjacent to the loops and in the cabinet. Identify each pair with the detector designation and loop number.

Install the conductors in a compacted layer of HMA immediately below the uppermost layer if more than one layer will be placed. Install the loop conductors before placing the uppermost layer of HMA. Fill the slot with a sealant flush to the surface.

Install the conductors in the existing pavement if one layer of HMA is to be placed. Install the loop conductors before placing the layer of HMA. Fill the slot with a sealant flush to the surface.

#### 87-1.03V(3) Preformed Inductive Loop Detectors

Construct a preformed inductive loop detector consisting of 4 turns in the loop and a lead-in conductor pair twisted at least 2 turns per foot all encased in conduit and sealed to prevent water penetration. The detector must be 6-foot square unless shown otherwise.

Construct the loop detector using a minimum 3/8-inch Schedule 40 or Schedule 80 PVC or polypropylene conduit and no. 16 or larger conductor with Type THWN or TFFN insulation.

In new roadways, place the detector in the base course with the top of the conduit flush with the top of the base. Cover with HMA or concrete pavement. Protect the detector from damage before and during pavement placement.

In new reinforced concrete bridge decks, secure the detector to the top of the uppermost layer of reinforcing steel using nylon wire ties. Hold the detector parallel to the bridge deck using PVC or polypropylene spacers where necessary. Place conduit for lead-in conductors between the uppermost 2 layers of reinforcing steel.

Do not install detectors in existing bridge decks unless authorized.

Install a detector in existing pavement before placement of concrete or HMA as follows:

- 1. Saw cut slots at least 1-1/4 inches wide into the existing pavement.
- 2. Place the detector in the slots. The top of the conduit must be at least 2 inches below the top of the pavement.
- 3. Test each loop circuit for continuity, circuit resistance, and insulation resistance.
- 4. Fill saw cuts with elastomeric or hot melt rubberized asphalt sealant for asphalt concrete pavement and with epoxy sealant or hot melt rubberized asphalt sealant for concrete pavement.

#### 87-1.03W Sealants

#### 87-1.03W(1) General

Reserved

#### 87-1.03W(2) Elastomeric Sealant

Apply an elastomeric sealant with a pressure feed applicator.

#### 87-1.03W(3) Asphaltic Emulsion Sealant

Asphaltic emulsion sealant must:

- 1. Be used for filling slots in asphalt concrete pavement of a maximum width of 5/8 inch
- 2. Not be used on concrete pavement or where the slope causes the material to run from the slot
- 3. Be thinned under the manufacturer's instructions
- 4. Be placed when the air temperature is at least 45 degrees F

#### 87-1.03W(4) Hot-Melt Rubberized Asphalt Sealant

Melt the sealant in a jacketed, double-boiler-type, melting unit. The temperature of the heat transfer medium must not exceed 475 degrees F.

Apply the sealant with a pressure feed applicator or a pour pot when the surface temperature of the pavement is greater than 40 degrees F.

#### 87-1.03X Reserved

#### 87-1.03Y Transformers

Installing a transformer includes placing the transformer inside a pull box, a cabinet, or an enclosure.

Wire the transformer for the appropriate voltage.

Ground the secondary circuit of the transformer as specified in the NEC.

87-1.03Z Reserved

#### 87-1.04 PAYMENT

Not Used

## 87-2 LIGHTING SYSTEMS

#### 87-2.01 GENERAL

#### 87-2.01A Summary

Section 87-2 includes specifications for constructing lighting systems.

Lighting system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Standards
- 6. Luminaires
- 7. Service equipment enclosure
- 8. Photoelectric control
- 9. Fuse splice connectors
- 10. High mast lighting assemblies

The components of a lighting system are shown on the project plans.

#### 87-2.01B Definitions

Reserved

#### 87-2.01C Submittals

Submit a certificate of compliance and test data for the high mast lighting luminaires.

#### 87-2.01D Quality Assurance

Reserved

87-2.02 MATERIALS 87-2.02A General Reserved
#### 87-2.02B High Mast Lighting Assemblies

A high mast lighting assembly includes the foundation, pole, lowering device system, luminaires, and control pedestal.

Each luminaire in a high mast lighting assembly must include a housing, an optical system, and a ballast.

The housing must be made of aluminum.

A painted or powder-coated housing for a high mast lighting luminaire must be able to withstand a 1,000-hour salt spray test as specified in ASTM B117.

The optical system, consisting of the reflector, refractor or lens, lamp socket, and lamp, must be in a sealed chamber. The chamber must be sealed by a gasket between the reflector and refractor or lens and a gasket between the reflector and lamp socket. The chamber must have a separate filter or filtering gasket for flow of air.

An asymmetrical luminaire must have a refractor or reflector that is rotatable 360 degrees around a vertical axis to orient the distribution of light.

The luminaire must have a slip fitter for mounting on a 2-inch horizontal pipe tenon and must be adjustable ±3 degrees from the axis of the tenon.

The reflector must have a specular surface made of silvered glass or aluminum protected by either an anodized finish or a silicate film. The reflector must be shaped such that a minimum of light is reflected through the arc tube of the lamp.

The refractor and lens must be made of heat-resistant glass.

The lamp socket must be a porcelain-enclosed, mogul-multiple type. The shell must contain integral lamp grips to ensure electrical contact under conditions of normal vibrations. The socket must be rated for 1,500 W, 600 V(ac) and 4,000 V(ac) pulse for a 400 W lamp and 5,000 V(ac) pulse for a 1,000 W lamp.

The luminaire must have a dual fuse holder for 2 fuses rated at 5 A, 480 V(ac). The fuses must be 13/32 inch by 1-1/2 inches, standard midget ferrule type with a nontime-delay feature.

The lamps must be vertical burning, protected from undue vibration, and prevented from backing out of the socket by a stainless steel clamp attached to the luminaire.

A 1,000 W metal halide lamp must have an initial output of 100,000 lumens and an average rated life of 12,000 hours based on 10 hours per start.

A 400 W high-pressure sodium lamp must have an initial output of 50,000 lumens. A 1,000 W high-pressure sodium lamp must have an initial output of 140,000 lumens.

The ballast for the luminaire must be a regulator type and have a core and coils, capacitors, and starting aid.

Ballast must be:

- 1. Mounted within a weatherproof housing that integrally attaches to the top of a luminaire support bracket and lamp support assembly
- 2. Readily removable without removing the luminaire from the bracket arm
- 3. Electrically connected to the optical assembly by a prewired quick disconnect

The ballast for a metal halide luminaire must comply with luminaire manufacturer's specifications.

The wattage regulation spread at any lamp voltage, from nominal through the life of the lamp, must vary no more than 22 percent for a 1,000 W lamp and a  $\pm 10$  percent input voltage variation. The ballast's starting line current must be less than its operating current.

#### 87-2.02C Soffit and Wall-Mounted Luminaires

#### 87-2.02C(1) General

Soffit and wall-mounted luminaires must be weatherproof and corrosion resistant.

Each luminaire must include a 70 W high-pressure sodium lamp with a minimum average rated life of 24,000 hours. The lamp socket must be positioned such that the light center of the lamp is located within 1/2 inch of the designed light center of the luminaire.

Luminaire wiring must be SFF-2.

Flush-mounted soffit luminaire must have:

- 1. Metal body with two 1-inch-minimum conduit hubs and a means of anchoring the body into the concrete
- 2. Prismatic refractor made of heat-resistant polycarbonate:
  - 2.1. Mounted in a door frame
  - 2.2. With the street side identified
- 3. Aluminum reflector with a specular anodized finish
- 4. Ballast located either within the housing or in a ceiling pull box if shown
- 5. Lamp socket

The door frame assembly must be hinged, gasketed, and secured to the luminaire body with at least 3 machine screws.

A pendant soffit luminaire must be enclosed and gasketed and have an aluminum finish. Luminaire must have:

- 1. Aluminum reflector with a specular anodized finish
- 2. Refractor made of heat-resistant polycarbonate
- 3. Optical assembly that is hinged and latched for lamp access and a device to prevent dropping
- 4. Ballast designed for operation in a raintight enclosure
- 5. Galvanized metal box with a gasketed cover, 2 captive screws, and 2 chains to prevent dropping and for luminaire mounting

Wall-mounted luminaire must have:

- 1. Cast metal body
- 2. Prismatic refractor:
  - 2.1. Made of glass
  - 2.2. Mounted in a door frame
- 3. Aluminum reflector with a specular anodized finish
- 4. Integral ballast
- 5. Lamp socket
- 6. Gasket between the refractor and the body
- 7. At least 2 mounting bolts of minimum 5/16-inch diameter

A cast aluminum body of a luminaire to be cast into or mounted against concrete must have a thick coat of alkali-resistant bituminous paint on all surfaces to be in contact with the concrete.

#### 87-2.02C(2) High-Pressure Sodium Lamp Ballasts

#### 87-2.02C(2)(a) General

A high-pressure sodium lamp ballast must operate the lamp for its rated wattage.

Starting aids for a ballast must be interchangeable between ballasts of the same wattage and manufacturer without adjustment.

The ballast must be provided with a heat-generating component to serve as a heat sink. The capacitor must be placed at the maximum practicable distance from the heat-generating components or thermally shielded to limit the case temperature to 75 degrees C.

The transformer and inductor must be resin impregnated for protection against moisture. Capacitors, except for those in starting aids, must be metal cased and hermetically sealed.

The ballast must have a power factor of 90 percent or greater.

For the nominal input voltage and lamp voltage, the ballast design center must not vary more than 7.5 percent from the rated lamp wattage.

#### 87-2.02C(2)(b) Regulator-Type Ballasts

A regulator-type ballast must be designed such that a capacitance variance of  $\pm 6$  percent does not cause more than  $\pm 8$  percent variation in the lamp wattage regulation.

The ballast must have a current crest factor not exceeding 1.8 for an input voltage variation of  $\pm 10$  percent.

The lamp wattage regulation spread for a lag-type ballast must not vary by more than 18 percent for  $\pm 10$  percent input voltage variations. The primary and secondary windings must be electrically isolated.

The lamp wattage regulation spread for a constant-wattage, autoregulator, lead-type ballast must not vary by more than 30 percent for  $\pm 10$  percent input voltage variations.

#### 87-2.02C(2)(c) Nonregulator-Type Ballasts

A nonregulator-type ballast must have a current crest factor not exceeding 1.8 for an input voltage variation of  $\pm 5$  percent.

The lamp wattage regulation spread for an autotransformer or high reactance type ballast must not vary by more than 25 percent for  $\pm 5$  percent input voltage variations.

#### 87-2.03 CONSTRUCTION

#### 87-2.03A General

Set the foundations for standards such that the mast arm is perpendicular to the centerline of the roadway.

Tighten the cap screws of the luminaire's clamping bracket to 10 ft-lb for LED and low-pressure luminaires.

Label the month and year of the installation inside the luminaire housing's door.

Perform the conductor and operational tests for the system.

#### 87-2.03B High Mast Lighting Assemblies

Mount and connect the luminaires to the accessory support ring. Aim the asymmetrical luminaire to orient the distribution of light.

#### 87-2.03C Soffit and Wall-Mounted Luminaires

For a flush-mounted soffit luminaire:

- 1. Prevent concrete from getting into the housing during pouring of the concrete for the structure
- 2. Install the luminaire with the axis vertical and the street side of the refractor oriented as indicated
- 3. Locate the luminaire to provide a minimum 2-foot clearance from the inside surface of the girders and 1-foot clearance from the near face of the diaphragm
- 4. Install the bridge soffit and ceiling pull box over the same lane

For a pendant soffit luminaire:

- 1. Cast in place the inserts for the no. 8 pull box during concrete placement for a new structure
- 2. Drill holes for expansion anchors to support the no. 8 pull box on existing structures
- 3. Bond the suspension conduit and luminaire to the pull box

For a wall-mounted luminaire, provide:

- 1. Extension junction box or ring on a new structure
- 2. 4 external mounting taps on an existing structure

Place the soffits or wall-mounted luminaires in operation as soon as practicable after the falsework has been removed from the structure.

If the Engineer orders soffit or wall-mounted luminaires to be activated before permanent power service is available, installing and removing the temporary power service is change order work.

#### 87-2.04 PAYMENT

Not Used

#### 87-3 SIGN ILLUMINATION SYSTEMS

#### 87-3.01 GENERAL

#### 87-3.01A Summary

Section 87-3 includes specifications for constructing sign illumination systems.

Sign illumination system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Sign lighting fixtures
- 6. Enclosure for the disconnect circuit breaker
- 7. Service equipment enclosure
- 8. Photoelectric control

The components of a sign illumination system are shown on the project plans.

#### 87-3.01B Definitions

Reserved

#### 87-3.01C Submittals

Submit the manufacturer's test data for the induction sign-lighting fixtures.

#### 87-3.01D Quality Assurance

Reserved

#### 87-3.02 MATERIALS

An induction sign-lighting fixture must include a housing with a door, reflector, refractor or lens, lamp, socket assembly, power coupler, high-frequency generator, fuse block, and fuses.

The fixture must comply with the isofootcandle curves as shown.

Fixture must weigh no more than 44 lb, be rated for 87 W at 120/240 V(ac), and have a mounting assembly made of one of the following materials:

- 1. Cast aluminum
- 2. Hot-dip galvanized steel plate
- 3. Galvanized steel plate finished with one of the following:
  - 3.1. Polymeric coating
  - 3.2. Same finish used for the housing

Housing must:

- 1. Be corrosion resistant and suitable for wet locations
- 2. Be above the top of the mounting rails at a maximum height of 12 inches
- 3. Have weep holes

Door must:

- 1. Hold a refractor or lens
- 2. Open without the use of special tools
- 3. Have a locking position at 50 degrees minimum from the plane of the door opening
- 4. Be hinged to the housing on the side of the fixture away from the sign panel
- 5. Have 2 captive latch bolts or other latching device

When the door is opened, it must lock in the 50 degrees position when an 85 mph, 3-second wind-gust load strikes the door from either side.

The housing and door must be manufactured of sheet or cast aluminum and have a gray powder coat or polyester paint finish. The sheet aluminum must comply with ASTM B209 or B209M for 5052-H32 aluminum sheet. External bolts, screws, hinges, hinge pins, and door closure devices must be corrosion resistant.

The housing and door must be gasketed. The thickness of the gasket must be a minimum of 1/4 inch.

Reflector must not be attached to the outside of the housing and must be:

- 1. Made of a single piece of aluminum with a specular finish
- 2. Protected with an electrochemically applied anodized finish or a chemically applied silicate film
- 3. Designed to drain condensation away from it
- 4. Secured to the housing with a minimum of 2 screws
- 5. Removable without removing any fixture parts

Refractor or lens must have a smooth exterior and must be manufactured from the materials shown in the following table:

| Component   | Material                                             |  |  |  |  |
|-------------|------------------------------------------------------|--|--|--|--|
| Flat lens   | Heat-resistant glass                                 |  |  |  |  |
| Convex lens | Heat-resistant, high-impact-resistant tempered glass |  |  |  |  |
| Refractor   | Borosilicate heat-resistant glass                    |  |  |  |  |

#### **Refractor and Lens Material Requirements**

The refractor and convex lens must be designed or shielded such that no luminance is visible if the fixture is approached directly from the rear and viewed from below. If a shield is used, it must be an integral part of the door casting.

Lamp must:

- 1. Be an 85 W induction type with a fluorescent, phosphor-coated, interior wall
- 2. Have a minimum 70 percent light output of its original lumen output after 60,000 hours of operation
- 3. Have a minimum color-rendering index of 80
- 4. Be rated at a color temperature of 4,000K
- 5. Be removable with common hand tools

The lamp socket must be rated for 1,500 W and 600 V(ac) and be a porcelain-enclosed mogul type with a shell that contains integral lamp grips to ensure electrical contact under normal vibration conditions. The shell and center contact must be made of nickel-plated brass. The center contact must be spring loaded.

The power coupler must be removable with common hand tools.

High-frequency generator must:

- 1. Start and operate lamps at an ambient temperature of -25 degrees C or greater for the rated life of the lamp
- 2. Operate continuously at ambient air temperatures from -25 to 55 degrees C without a reduction in the generator life
- 3. Have a design life of at least 100,000 hours at 55 degrees C
- 4. Have an output frequency of 2.65 MHz ± 10 percent
- 5. Have radio frequency interference that complies with 47 CFR 18 regulations regarding harmful interference
- 6. Have a power factor greater than 90 percent and total harmonic distortion less than 10 percent

The high frequency generator must be mounted such that the fixture can be used as a heat sink and be replaceable with common hand tools.

Each fixture must include a barrier-type fuse block for terminating field connections. Fuse block must:

- 1. Be rated 600 V(ac)
- 2. Have box terminals
- 3. Be secured to the housing and accessible without removal of any fixture parts
- 4. Be mounted to leave a minimum of 1/2 inch of air space from the sidewalls of the housing
- 5. Be designed for easy removal of fuses with a fuse puller

The fixture's fuses must be 13/32-inch-diameter, 1-1/2-inch-long ferrule type and UL listed or NRTL certified. For a 120 V(ac) fixture, only the ungrounded conductor must be fused and a solid connection must be provided between the grounded conductor and the high frequency generator.

The fixture must be permanently marked with the manufacturer's brand name, trademark, model number, serial number, and date of manufacture on the inside and outside on the housing. The same information must be marked on the package.

If a wire guard is used, it must be made of a minimum 1/4-inch-diameter galvanized steel wire. The wires must be spaced to prevent rocks larger than 1-1/2-inch diameter from passing through the guard. The guard must be either hot-dip galvanized or electroplated zinc-coated as specified in ASTM B633, service condition SC4, with a clear chromate dip treatment.

#### 87-3.03 CONSTRUCTION

Perform the conductor and operational tests for the system.

#### 87-3.04 PAYMENT

Not Used

#### 87-4 SIGNAL AND LIGHTING SYSTEMS

#### 87-4.01 GENERAL

#### 87-4.01A Summary

Section 87-4 includes specifications for constructing signal and lighting systems.

Signal and lighting system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Cables
- 6. Standards
- 7. Signal heads
- 8. Internally illuminated street name signs
- 9. Service equipment enclosure
- 10. Department-furnished controller assembly
- 11. Detectors
- 12. Telephone demarcation cabinet
- 13. Accessible pedestrian signals
- 14. Push button assemblies
- 15. Pedestrian signal heads
- 16. Luminaires
- 17. Photoelectric control
- 18. Fuse splice connectors
- 19. Battery backup system
- 20. Flashing beacons
- 21. Flashing beacon control assembly

The components of a signal and lighting system are shown on the project plans.

#### 87-4.01B Definitions

Reserved

#### 87-4.01C Submittals

Submit shop drawings showing the message for each internally illuminated street sign, including the size of letters, symbols, and arrows.

87-4.01D Quality Assurance 87-4.01D(1) General

Reserved

87-4.01D(2) Quality Control 87-4.01D(2)(a) General

Reserved

#### 87-4.01D(2)(b) Battery Backup System

Notify the Engineer 48 hours before testing the battery backup system.

Test the system in the presence of the Engineer by turning off the power to the signal system at the service equipment enclosure. The signal system must run continuously for 30 minutes. If the battery backup system fails, correct the problem and retest the system for another 30 minutes. After successful completion of the test, turn the power on for the signal system.

#### 87-4.02 MATERIALS

#### 87-4.02A General

Reserved

#### 87-4.02B Battery Backup System

A battery backup system includes the cabinet, batteries, and the Department-furnished electronics assembly.

The electronics assembly includes the inverter/charger unit, power transfer relay, and the battery harness.

#### 87-4.02C Internally Illuminated Street Name Signs

An internally illuminated street name sign includes housing, brackets, sign panels, gaskets, ballast, lampholder, terminal blocks, conductors, and fuses.

An internally illuminated street sign must be designed and constructed to prevent deformation or failure when subjected to an 85 mph, 3-second wind-gust load as specified in the AASHTO publication, "Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals."

Sign must:

- 1. Be Types A or B
- 2. Have galvanized or cadmium-plated ferrous parts
- 3. Have screened weep holes
- 4. Have fasteners, screws, and hardware made of passive stainless steel, Type 302 or 304, or aluminum Type 6060-T6
- 5. Operate at a temperature from -20 to 74 degrees C

Photoelectric unit sockets are not allowed.

The housing must be constructed to resist torsional twist and warp. The housing must be designed such that opening or removing the panels provides access to the interior of the sign for lamp, ballast, and fuse replacement.

The top and bottom of the sign must be manufactured from formed or extruded aluminum and attached to formed or cast aluminum end fittings. The top, bottom, and end fittings must form a sealed housing.

For a Type A sign, both sides of the sign must be hinged at the top to allow installation or removal of the sign panel.

For a Type B sign, the sign panel must be slide mounted into the housing.

The top of the housing must have 2 free-swinging mounting brackets. Each bracket must be vertically adjustable for leveling the sign to either a straight or curved mast arm. The bracket assembly must allow the lighting fixture to swing perpendicular to the sign panel.

The reflectors must be formed aluminum and have an acrylic, baked-white-enamel surface with a minimum reflectance of 0.85.

Sign panel must be translucent, high-impact-resistant, and made of one of the following plastic materials:

- 1. Glass-fiber-reinforced, acrylated resin
- 2. Polycarbonate resin
- 3. Cellulose acetate butyrate

The sign panel must be designed not to crack or shatter if a 1-inch-diameter steel ball weighing 2.4 ounces is dropped from a height of 8.5 feet above the sign panel to any point on the panel. For this test, the sign panel must be lying in a horizontal position and supported within its frame.

The sign panel's surface must be evenly illuminated. The brightness measurements for the letters must be a minimum of 150 foot-lamberts, average. The letter-to-background brightness ratio must be from 10:1 to 20:1. The background luminance must not vary by more than 40 percent from the average background brightness measurement. The luminance of letters, symbols, and arrows must not vary by more than 20 percent from their average brightness measurement.

The sign panel's white or green color must not fade or darken if exposed to an accelerated test of UV light equivalent to 2 years of outdoor exposure.

The sign panel's legend, symbols, arrows, and border on each face must be white on a green background. The background must comply with color no. 14109 of FED-STD-595.

The message must appear on both sides of the sign and be protected from UV radiation. The letters must be 8-inch upper case and 6-inch lower case, series E.

A Type A sign must have a closed-cell, sponge-neoprene gasket installed between the sign panel frame to prevent the entry of water. The gasket must be uniform and even textured.

The sign ballast must be a high-power-factor type for outdoor operation from 110 to 125 V(ac) and 60 Hz and must comply with ANSI C82.1 and C82.2.

The ballast for a Type A sign must be rated at 200 mA. The ballast for a Type B sign must be rated at 430 mA.

Sign lampholder must:

- 1. Be the spring-loaded type
- 2. Have silver-coated contacts and waterproofed entrance leads
- 3. Have a heat-resistant, circular cross section with a partially recessed neoprene ring

Removal of the lamp from the socket must de-energize the primary of the ballast.

The springs for the lampholders must not be a part of the current-carrying circuit.

The sign's wiring connections must terminate on a molded, phenolic, barrier-type, terminal block rated at 15 A, 1,000 V(ac). The connections must have a white, integral, waterproof marking strip. The terminal screws must not be smaller than a no. 10.

The terminal block must be insulated from the fixture to provide protection from the line-to-ground flashover voltage.

A sectionalized terminal block must have an integral barrier on each side and must allow rigid mounting and alignment.

Fixture's conductors must:

1. Be stranded copper wire with a minimum thermoplastic insulation of 28 mils

- 2. Be rated at 1,000 V(ac) and for use up to 90 degrees C
- 3. Be a minimum of no. 16
- 4. Match the color coding of the ballast leads
- 5. Be secured with spring cross straps, installed 12 inches apart or less in the chassis or fixture

Stranded copper conductors connected to screw-type terminals must terminate in crimp-type ring connectors.

No splicing is allowed within the fixture.

The sign's fuse must be the Type 3AG, miniature, slow-blow type.

The fuse holder must be a panel-mounting type with a threaded or bayonet knob that grips the fuse tightly for extraction. Each ballast must have a separate fuse.

#### 87-4.03 CONSTRUCTION

#### 87-4.03A General

Set the foundations for standards such that the mast arm is perpendicular to the centerline of the roadway.

Tighten the cap screws of the luminaire's clamping bracket to 10 ft-lb for LED and low-pressure luminaires.

Label the month and year of the installation inside the luminaire housing's door.

Perform the conductor and operational tests for the system.

#### 87-4.03B Battery Backup System Cabinets

Install the battery backup system cabinet to the right of the Model 332L cabinet.

If installation on the right side is not feasible, obtain authorization for installation on the left side.

Provide access for power conductors between the cabinets using:

- 1. 2" nylon-insulated, steel chase nipple
- 2. 2" steel sealing locknut
- 3. 2" nylon-insulated, steel bushing

Remove the jumper between the terminals labeled *BBS-1* and *BBS-2* in the 5 position terminal block in the controller cabinet before connecting the Department-furnished electronics assembly.

#### 87-4.03C Internally Illuminated Street Name Signs

Mount the internally illuminated street name sign to the signal mast arm using the adjustable brackets. Connect the conductors to the terminal blocks in the signal head mounting terminal block.

#### 87-4.04 PAYMENT

Not Used

#### 87-5 RAMP METERING SYSTEMS

#### 87-5.01 GENERAL

Section 87-5 includes specifications for constructing ramp metering systems.

Ramp metering system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Standards
- 6. Signal heads
- 7. Service equipment enclosure
- 8. Department-furnished controller assembly

- 9. Detectors
- 10. Telephone demarcation cabinet

The components of a ramp metering system are shown on the project plans.

#### 87-5.02 MATERIALS

Not Used

#### 87-5.03 CONSTRUCTION

Connect the field wiring to the terminal blocks in the controller cabinet. The Engineer provides you a list of field conductor terminations for each controller cabinet.

Perform the conductor and operational tests for the system.

#### 87-5.04 PAYMENT

Not Used

#### 87-6 TRAFFIC MONITORING STATION SYSTEMS

#### 87-6.01 GENERAL

Section 87-6 includes specifications for constructing traffic monitoring station systems.

Traffic monitoring station system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Cables
- 5. Conductors
- 6. Service equipment enclosure
- 7. Controller cabinet
- 8. Detectors
- 9. Telephone demarcation cabinet

The components of a traffic monitoring station system are shown on the project plans.

#### 87-6.02 MATERIALS

Not Used

#### 87-6.03 CONSTRUCTION

Connect the field wiring to the terminal blocks in the controller cabinet. The Engineer provides you a list of field conductor terminations for the controller cabinet.

Perform the conductor and operational tests for the system.

#### 87-6.04 PAYMENT

Not Used

#### 87-7 FLASHING BEACON SYSTEMS

#### 87-7.01 GENERAL

Section 87-7 includes specifications for constructing flashing beacon systems.

Flashing beacon system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Standards
- 6. Service equipment enclosure
- 7. Signal heads
- 8. Flashing beacon control assembly

The components of a flashing beacon system are shown on the project plans.

The flash rate for the flashing beacon must comply with chapter 4L, "Flashing Beacons," of the *California MUTCD*.

The flashing beacon must allow alternating flashing wig-wag operation.

The flashing beacon must have a separate flasher unit installed in the flashing beacon control assembly.

#### 87-7.02 MATERIALS

Flashing beacon control assembly must:

- 1. Have a NEMA 3R enclosure with a dead front panel and a hasp with a 7/16-inch hole for a padlock. The enclosure must have one of the following finishes:
  - 1.1. Powder coating.
  - 1.2. Hot-dip galvanized coating.
  - 1.3. Factory-applied, rust-resistant prime coat and finish coat.
- 2. Have barrier-type terminal blocks rated for 25 A, 600 V(ac), made of molded phenolic or nylon material and have plated-brass screw terminals and integral marking strips.
- 3. Include a solid state flasher complying with section 8 of NEMA standards publication no. TS 1 for 10 A, dual circuits.

#### 87-7.03 CONSTRUCTION

Perform the conductor and operational tests for the system.

#### 87-7.04 PAYMENT

Not Used

#### 87-8-87-11 RESERVED

#### 87-12 CHANGEABLE MESSAGE SIGN SYSTEMS

#### 87-12.01 GENERAL

Section 87-12 includes specifications for constructing changeable message sign systems.

Changeable message sign system includes:

- 1. Foundations
- 2. Pull boxes
- 3. Conduit
- 4. Conductors
- 5. Service equipment enclosure
- 6. Department-furnished controller cabinet
- 7. Department-furnished changeable message sign
- 8. Department-furnished wiring harness
- 9. Service equipment enclosure
- 10. Sign disconnect

The components of a changeable message sign system are shown on the project plans.

#### 87-12.02 MATERIALS

Not Used

#### 87-12.03 CONSTRUCTION

Install the changeable message sign.

Connect the field wiring to the terminal blocks in the sign assembly and controller cabinet.

The Engineer provides you a list of field conductor terminations for each sign cabinet and controller cabinet.

The Department maintains the sign assemblies.

#### 87-12.04 PAYMENT

Not Used

#### 87-13-87-17 RESERVED 87-18 INTERCONNECTION CONDUIT AND CABLE

#### 87-18.01 GENERAL

Section 87-18 includes specifications for constructing interconnection conduit and cable.

Interconnection conduit and cable includes:

- 1. Pull boxes
- 2. Conduit
- 3. Signal interconnect cables

The components of an interconnection conduit and cable are shown.

#### 87-18.02 MATERIALS

Not Used

#### 87-18.03 CONSTRUCTION

Test the signal interconnect cable.

Connect the signal interconnect cable to the terminal block in the controller cabinets. The Engineer provides you a list of terminations for each controller cabinet.

#### 87-18.04 PAYMENT

Not Used

#### 87-19 RESERVED

#### 87-20 TEMPORARY ELECTRICAL SYSTEMS

#### 87-20.01 GENERAL

Section 87-20 includes specifications for providing temporary electrical systems.

Obtain the Department's authorization for the type of temporary electrical system and its installation method.

A temporary system must operate on a continuous, 24-hour basis.

#### 87-20.02 MATERIALS

#### 87-20.02A General

Material and equipment may be new or used.

The components of a temporary system are shown on the project plans.

If you use Type UF-B cable, the minimum conductor size must be no. 12.

#### 87-20.02B Temporary Flashing Beacon Systems

A temporary flashing beacon system consists of a flashing beacon system, wood post, generator, and photovoltaic system.

The system must comply with the specifications for a flashing beacon system in section 87-7, except it may be mounted on a wood post or a trailer.

#### 87-20.02C Temporary Lighting Systems

A temporary lighting system consists of a lighting system, generator, and wood poles.

The system must comply with the specifications for a lighting system in section 87-2, except it may be mounted on a wood pole or a trailer.

#### 87-20.02D Temporary Signal Systems

A temporary signal system consists of a signal and lighting system, wood poles and posts, and a generator.

System must comply with the specifications for a signal and lighting system in section 87-4, except:

- 1. Signal heads may be mounted on a wood pole, mast arm, tether wire, or a trailer
- 2. Flashing beacons may be mounted on a wood post, or a trailer

#### 87-20.03 CONSTRUCTION

#### 87-20.03A General

Provide electrical and telecommunication services for temporary systems. Do not use existing services unless authorized.

Provide power for the temporary electrical systems under section 12-3.33, except you may use a photovoltaic system for the temporary flashing beacon system.

Install conductors and cables in a conduit, suspended from wood poles at least 25 feet above the roadway, or use direct burial conductors and cables.

You may saw slots across paved areas for burial conductors and cables.

Install conduit outside the paved area at a minimum of 12 inches below grade for Type 1 and 2 conduit and at a minimum of 18 inches below grade for Type 3 conduit.

Install direct burial conductors and cables outside the paved area at a minimum depth of 24 inches below grade.

Place the portions of the conductors installed on the face of wood poles in either Type 1, 2, or 3 conduit between the point 10 feet above grade at the pole and the pull box. The conduit between the pole and the pull box must be buried at a depth of at least 18 inches below grade.

Place conductors across structures in a Type 1, 2, or 3 conduit. Attach the conduit to the outside face of the railing.

Mount the photoelectric unit at the top of the standard or wood post.

You may abandon in place conductors and cables in sawed slots or in conduit installed below the ground surface.

#### 87-20.03B Temporary Flashing Beacon Systems

Install a fused-splice connector in the pull box adjacent to each flashing beacon. Wherever conductors are run overhead, install the splice connector in the line side outside of the control assembly.

#### 87-20.03C Temporary Lighting Systems

Wherever conductors are run overhead, install the fuse splice connectors in the line side before entering the mast arm.

#### 87-20.03D Temporary Signal Systems

You may splice conductors that run to a terminal compartment or a signal head on a pole to the through conductors of the same phase in a pull box adjacent to the pole. Do not splice conductors or cables except in a pull box or in a NEMA 3R enclosure.

The Department provides the timing for the temporary signal.

Maintain the temporary signal except for the Department-furnished controller assembly.

#### 87-20.04 PAYMENT

Not Used

#### 87-21 EXISTING ELECTRICAL SYSTEMS

#### 87-21.01 GENERAL

Section 87-21 includes general specifications for performing work on existing electrical systems.

#### 87-21.02 MATERIALS

Not Used

#### 87-21.03 CONSTRUCTION

#### 87-21.03A General

You may abandon unused underground conduit after pulling out all conductors and removing conduit terminations from the pull boxes.

If standards are to be salvaged, remove:

- 1. All components
- 2. Mast arms from the standards
- 3. Luminaires, signal heads, and signal mounting assemblies from the standards and mast arms

If the existing material is unsatisfactory for reuse and the Engineer orders you to replace it with new material, replacing the existing material with new material is change order work.

If the removed electrical equipment is to be reinstalled, supply all materials and equipment, including signal mounting assemblies, anchor bolts, nuts, washers, and concrete, needed to complete the new installation.

#### 87-21.03B Maintaining Existing Electrical Systems

#### 87-21.03B(1) General

Maintain the existing electrical system in working order during the progress of the work. Conduct your operations to avoid damage to the elements of the systems.

#### 87-21.03B(2) Maintaining Existing Traffic Management System Elements During Construction

Section 87-21.02B(2) applies if a bid item for maintaining existing traffic management system elements during construction is shown on the Bid Item List.

Traffic management system elements include:

- 1. Ramp metering system
- 2. Traffic monitoring stations
- 3. Microwave vehicle detection system
- 4. Changeable message sign system
- 5. Extinguishable message sign system
- 6. Highway advisory radio system
- 7. Closed circuit television camera system
- 8. Roadway weather information system

Obtain authorization at least 72 hours before interrupting communication between an existing system and the traffic management center.

If the Engineer notifies you that an existing system is not fully operational due to your activities, repair or replace the system within 72 hours. If the system cannot be fixed within 72 hours or it is located on a structure, provide a temporary system within 24 hours until the system can be fixed. Perform a functional test of the system in the presence of the Engineer. If you fail to perform the necessary repair or replacement work, the Department may perform the repair or replacement work and deduct the cost.

If you damage an existing fiber optic cable, install a new cable such that the length of cable slack is the same as before the damage, measured from an original splice point or termination. All splices must be made using the fusion method.

You may interrupt the operation of traffic monitoring stations:

1. For 60 days if another operational traffic monitoring station is located within 3 miles

2. For 15 days if another operational traffic monitoring station is located more than 3 miles away

If a traffic monitoring station must be interrupted for longer periods than specified, provide a temporary detection system. Obtain the Department's authorization for the type of temporary system and its installation method.

#### 87-21.03C Modifying Existing Electrical Systems

Modify electrical systems as shown.

#### 87-21.03D Removing Existing Electrical Systems

The components to be removed are shown on the project plans.

#### 87-21.04 PAYMENT

Not Used

^^^^

## DIVISION XI MATERIALS 90 CONCRETE

07-15-16

#### Replace *Method 1* in the 4th paragraph of section 90-1.01D(5)(a) with:

Method 2

Replace section 90-9 with:

07-15-16

07-15-16

#### 90-9 RETURNED PLASTIC CONCRETE

#### 90-9.01 GENERAL

#### 90-9.01A Summary

Section 90-9 includes specifications for incorporating returned plastic concrete (RPC) into concrete.

RPC must be used only where the specifications allow its use. Do not use RPC in pavement or structural concrete.

#### 90-9.01B Definitions

returned plastic concrete (RPC): Excess concrete that is returned to a concrete plant in a plastic state and that has not attained initial set.

hydration stabilizing admixture (HSA): Extended set retarding admixture that controls and predictably reduces the hydration rate of the cementitious material.

#### 90-9.01C Submittals

Submit the following with the weighmaster certificate:

- 1. Weight or volume of RPC
- 2. Type, brand, and dosage of HSA
- 3. Time of adding HSA
- 4. Copy of the original weighmaster certificate for the RPC
- 5. Temperature of RPC

When requested, submit the HSA manufacturer's instructions, including dosage tables.

#### 90-9.01D Quality Assurance

The material plant producing concrete containing RPC must be authorized under the MPQP.

For volumetric proportioning of RPC:

- 1. The volumetric container must be imprinted with manufacturer's name, model number, serial number, the as-calibrated volume and date of the last calibration. Cross sectional dimensions of the container must remain the same as those during its calibration.
- The device must be re-calibrated monthly and at any time when the container shape has been deformed from its original condition or there is evidence of material build-up on the inside of the device.
- 3. The device must be held in a level condition during filling. Fill the device to the measure or strike-off line. Each measurement must be filled to within 1.0% of the device as-calibrated volume.
- 4. The device interior must be cleaned after each measurement to maintain a zero condition.

For weight proportioning, proportion RPC with a weigh hopper attached to the plant at a position which allows the addition of the RPC to the mixer truck with the conventional PCC ingredients. The plant process controller must control the proportioning of RPC to within 1.0% of its target weight.

#### 90-9.02 MATERIALS

#### 90-9.02A General

The quantity of RPC added to the concrete must not exceed 15 percent.

The cementitious material content of the RPC must be at least that specified for the concrete that allows the use of RPC.

Water must not be added to the RPC after batching, including in the truck mixer.

Use HSA for controlling and reducing the hydration rate of RPC.

Incorporate RPC by mixing into the concrete before arriving at the jobsite.

#### 90-9.02B Returned Plastic Concrete

The RPC must not exceed 100 degrees F at any time.

If HSA is not used, RPC must be incorporated into the concrete before attaining initial set or within 4 hours after batching of RPC, whichever is earlier.

If HSA is used:

- 1. Add HSA to RPC within 4 hours after original batching.
- 2. Measure and record the time, dosage of HSA, and temperature of RPC when HSA is added.
- 3. Mix the RPC under the HSA manufacturer's instructions after adding HSA or at least 30 revolutions, whichever is greater.
- 4. Incorporate RPC into the concrete within 4 hours after adding HSA.

RPC must not contain:

- 1. Accelerating admixture
- 2. Fiber
- 3. Pigment
- 4. Lightweight aggregate
- 5. Previously returned RPC
- 6. Any ingredient incompatible with the resultant concrete

#### 90-9.02C Hydration Stabilizing Admixture

HSA must comply with ASTM C494 admixture Type B or Type D.

HSA must have a proven history of specifically maintaining and extending both plasticity and set.

HSA dosage must comply with the manufacturer's instructions.

#### 90-9.02D Production

Proportion concrete containing RPC under section 90-2.02E.

Proportion RPC by weight or by volume.

90-9.03 CONSTRUCTION Not Used

90-9.04 PAYMENT Not Used

#### ^^^^

#### 92 ASPHALT BINDERS

04-15-16

04-15-16

01-15-16

#### Replace the 4th paragraph of section 92-1.02B with:

Crumb rubber modifier used must be on the Authorized Materials List for crumb rubber modifier.

Production equipment for PG modified asphalt binder with crumb rubber modifier must be authorized under the Department's *MPQP*.

Crumb rubber must be derived from waste tires described in Pub Res Code § 42703 and must be free from contaminants including fabric, metal, minerals, and other nonrubber substances.

#### ^^^^

#### 96 GEOSYNTHETICS

01-15-16

Replace *product name, manufacturing source, and date of manufacture* in the 2nd sentence of the 1st paragraph of section 96-1.01D with:

manufacturing source code

#### CONTRACTOR REQUEST FOR CLARIFICATION

## **BITUMINOUS SEAL COATS**

#### **CONTRACT NUMBER: 17-25-C**

Requests for clarification of the plans and specifications regarding this project shall be submitted on this form. Any change or clarification of the project plans and specifications shall be in the form of a written addendum issued to planholders of record. Contractors requesting clarification shall complete the following:

Fax form to (559) 600-4399 or e-mail to DesignServices@co.fresno.ca.us

FIRM NAME: \_\_\_\_\_

SENDER / CONTACT NAME: \_\_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_

 Zip Code

 BUSINESS PHONE: (\_\_\_\_)

Drawing No.: Spec Section:

Question Type or print one question below

#### Response

| The following section is for | County use only. |       |  |
|------------------------------|------------------|-------|--|
| Response By:                 | ·····            | Date: |  |
|                              |                  | 5.4   |  |
| Included in Addendum No.     |                  | Date: |  |
|                              |                  |       |  |

This form may be removed from the project specifications and/or reproduced as needed.

# **BID BOOK**

**BITUMINOUS SEAL COATS** 

Various Locations in Fresno County

BUDGET / ACCOUNT: 4510 / 7370



Department of Public Works and Planning

**CONTRACT NUMBER: 17-25-C** 

**COPY NUMBER:** 

# BID BOOK TABLE OF CONTENTS

# PROJECT: BITUMINOUS SEAL COATS

#### **CONTRACT NUMBER: 17-25-C**

| PROPOSAL<br>NUMBER(S) | Тітle                                                                                        |  |  |  |  |  |
|-----------------------|----------------------------------------------------------------------------------------------|--|--|--|--|--|
| NOT<br>APPLICALBLE    | INSTRUCTIONS FOR COMPLETING THE BID BOOK                                                     |  |  |  |  |  |
| 1                     | PROPOSAL TO THE BOARD OF SUPERVISORS OF THE COUNTY OF FRESNO                                 |  |  |  |  |  |
| 2 BID SHEET           |                                                                                              |  |  |  |  |  |
| 3                     | EVALUATION OF BID PROPOSAL SHEETS                                                            |  |  |  |  |  |
| 4                     | BID SECURITY                                                                                 |  |  |  |  |  |
| 5                     | NON-COLLUSION AFFIDAVIT                                                                      |  |  |  |  |  |
| 6                     | PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT                                               |  |  |  |  |  |
| 7                     | PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE AND PUBLIC<br>CONTRACT CODE 10232 STATEMENT |  |  |  |  |  |
| 8(A) – 8(B)           | SUBCONTRACTORS                                                                               |  |  |  |  |  |
| 9 - 14                | NOT USED                                                                                     |  |  |  |  |  |
| 15                    | OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS                                  |  |  |  |  |  |
| 16                    | GUARANTY                                                                                     |  |  |  |  |  |

# INSTRUCTIONS FOR COMPLETING THE BID BOOK FOR NON-FEDERAL AID PROJECTS

#### General

Complete forms in the Bid book.

Submit your bid:

- 1. Under sealed cover
- 2. Marked as a bid
- 3. Identifying the contract number and the bid opening date

Certain bid forms must be submitted with the bid and properly executed.

Certain other forms and information must be submitted either with the bid or within the prescribed period after bid opening as specified elsewhere in these special provisions.

Failure to submit the forms and information as specified results in a nonresponsive bid.

If an agent other than the authorized corporation officer or a partnership member signs the bid, file a Power of Attorney with the Department either before opening bids or with the bid. Otherwise, the bid may be nonresponsive.

#### **Bid Item List and Bid Comparison**

Submit a bid based on the bid item quantities the Department shows on the Bid Item List. Bids will be evaluated and the low bidder determined as indicated in the *Notice to Bidders*.

#### **Bid Document Completion**

Proposal sheets are identified by title and by the letter "P" followed by the number assigned to the proposal sheet in question. Proposal sheets are included in the *Bid Book.* 

#### Proposal 1 - Proposal to the Board of Supervisors of Fresno County

Provided for information.

#### Proposal 2 - Bid Proposal Sheet

One or more sheet(s) upon which the bidder completes the bid.

Fill out completely including a unit price and total for each unit price-based item and a total for each lump sum item.

Do not make any additions such as "plus tax", "plus freight", or conditions such as "less 2% if paid by 15th".

Use ink or typewriter.

#### **Proposal 3 - Evaluation of Bid Proposal Sheet**

Describes how inconsistences and irregularities are evaluated and corrected when Design Services reviews the Bid Sheet.

#### Proposal 4 - Bid Security and Signature

Submit one of the following forms of bidder's security equal to at least 10 percent of the bid:

- Cash
- Cashier's check
- Certified check
- Signed bidder's bond by an admitted surety insurer

Indicate type of bid security provided.

- Cash Acceptable but not recommended. Cash is deposited in a clearing account and is returned to bidders by County warrant. This process may take several weeks.
- Cashier's or Certified Checks. This type of security is held until the bid is no longer under consideration. If submitted by a potential awardee, they will be returned when the contract is fully executed by the bidder and bonds and insurance have been approved.
- Bid Bonds Must be signed by the bidder and by the attorney-in-fact for the bonding company. Provide notarized signature of attorney-in-fact accompanied by bonding company's affidavit authorizing attorney-in-fact to execute bonds. An unsigned bid bond will be cause for rejection.

#### Acknowledge Addenda

Provide contractor's license information.

State business name and if business is a:

- Corporation list officers
- Partnership list partners
- Joint Venture list members; if members are corporations or partnerships, list their officers or partners.
- Individual list Owner's name and firm name style

Signature of Bidder - the following lists types of companies and corresponding authorized signers.

- Corporation by an officer
- Partnership by a partner
- Joint Venture by a member
- Individual by the Owner

If signature is by a Branch Manager, Estimator, Agent, etc., the bid must be accompanied by a power of attorney authorizing the individual to sign the bid in question or to sign bids more generally, otherwise the bid may be rejected.

- Business Address Firm's Street Address
- Mailing Address P.O. Box or Street Address
- Complete, sign, and return with bid.

#### Proposal 5 - Non-Collusion Affidavit

Must be completed, signed, and returned with bid.

#### Proposal 6 - Public Contract Code Section 10285.1 Statement

Check "has" or "has not" in accordance with instructions on form, return with completed for with bid. Note that signing the bid constitutes signing this statement.

#### Proposal 7 - Public Contract Code Section 10162 Questionnaire and Public Contract Code 10232 Statement

Check: "yes" or "no" accordance with instructions on form, include explanation if "yes" is checked. Return completed form with bid. Note that signing the bid constitutes signing this questionnaire and statement.

#### Proposal 8(a) through Proposal 8(f) - Subcontractors

Sheet(s) upon which bidders list subcontractors. List each subcontractor to perform work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.).

The *Subcontractor List* submitted with the bid must show the name, location of business, work portions to be performed, and the contractor's license number for each subcontractor listed.

- Use subcontractor's business name style as registered with the License Board.
- Specify the city in which the subcontractor's business is located and the state if other than California.
- Description of the work to be performed by the subcontractor. Indicate with bid item numbers from the bid sheet and/or work descriptions similar to those on bid sheet.
- List license number for each subcontractor.

Upon request from Design Services, provide the following additional information within 24 hours of bid opening if not included on the *Subcontractor List* submitted with the bid:

- Complete physical address for each subcontractor listed.
- Percentage of the total bid or dollar amount associated with each subcontractor listed.
- Department of Industrial Relations registration number.

#### Proposal 9 - Proposal 14 - Not Used

#### Proposal 15 - Opt out of payment adjustments for price index fluctuations

You may opt out of the payment adjustments for price index fluctuations specified in section 9-1.07. To opt out, submit a completed *Opt Out of Payment Adjustments for Price Index Fluctuations* form with your bid.

#### Proposal 16 - Guaranty

Does not need to be signed with the bid. Part of the contract which must be signed by the contractor when contract is executed.

hereinafter called the Owner

# **BITUMINOUS SEAL COATS**

## CONTRACT NO. 17-25-C

The work embraced herein shall be done in accordance with the 2015 Standard Specifications and with the 2015 Standard Plans, of the State of California, Department of Transportation insofar as the same may apply and in accordance with these special provisions.

Except to the extent that they may conflict with these special provisions, revised Standard Specifications apply to the extent included in the section entitled "Project Details" of the book entitled "Specifications."

The undersigned, as bidder, declares that the only persons, or parties interested in this proposal as principals are those named herein, that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, and the plans therein referred to; and he proposes and agrees if this proposal is accepted, that he will contract with the Owner to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefor the following unit prices, to-wit:

Proposal 1

# COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C

**BASE BID (LOCATIONS 1 THROUGH 10)** 

| ITEM<br>NO. | ESTIMATED<br>QUANTITY | F,S     | UNIT OF<br>MEASURE | ITEM                                                 | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
|-------------|-----------------------|---------|--------------------|------------------------------------------------------|----------------------------|-----------------------------|
| 1           | 20,700                |         | \$                 | SUPPLEMENTAL WORK                                    | \$1                        | \$20,700                    |
| 2           | 1                     | S       | LS                 | TRAFFIC CONTROL SYSTEM                               |                            |                             |
| 3           | 1                     |         | LS                 | TEMPORARY PAVEMENT MARKING                           |                            |                             |
| 4           | 1                     |         | LS                 | JOB SITE MANAGEMENT                                  |                            |                             |
| 5           | 1                     |         | LS                 | PREPARE WATER POLLUTION CONTROL PROGRAM              |                            |                             |
| 6           | 1,298                 |         | TON                | SAND COVER (SEAL)                                    |                            |                             |
| 7           | 581                   |         | TON                | POLYMER ASPHALTIC EMULSION (SEAL COAT)               |                            |                             |
| 8           | 5,395                 |         | TON                | SCREENINGS (3/8")                                    |                            |                             |
| 9           | 113                   |         | TON                | ASPHALTIC EMULSION (FLUSH COAT)                      |                            |                             |
| 10          | 18                    | S       | EA                 | PAVEMENT MARKER (TYPE D)                             |                            |                             |
| 11          | 4,000                 | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 27B) |                            |                             |
| 12          | 131,757               | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 5)   |                            |                             |
| 13          | 23,200                | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 18)  |                            |                             |
| 14          | 200                   | S       | SF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 28)  |                            |                             |
| 15          | 200                   | S       | SF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29)  |                            |                             |
| 16          | 22                    | S       | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP)                |                            |                             |
| 17          | 954                   | S       | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP AHEAD)          |                            |                             |
| 18          | 253                   | S       | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP BAR)            |                            |                             |
| 19          | 55                    | S       | SF                 | THERMOPLASTIC PAVEMENT MARKING (YIELD AHEAD)         |                            |                             |
| 20          | 236                   | S       | SF                 | REMOVE THERMOPLASTIC PAVEMENT MARKING                |                            |                             |
| 21          | 40,738                | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 5)       |                            |                             |
| 22          | 6,400                 | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 18)      |                            |                             |
| 23          | 200                   | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 28)      |                            |                             |
| 24          | 200                   | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)      |                            |                             |
| 25          | 1                     |         | LS                 | MOBILIZATION                                         |                            |                             |
| TOTAL       | BASE BID (ITEN        | IS 1 TH | ROUGH 25)          |                                                      |                            |                             |

F - Final Pay Item S - Specialty Item

# COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C Fr

| From To             |                       |         |                    |                                                     |                            |                             |
|---------------------|-----------------------|---------|--------------------|-----------------------------------------------------|----------------------------|-----------------------------|
| ADDITIVE 1A AUBERRY |                       | AUBERRY | MILLERTON (WEST)   | GREEN MEADOV                                        | V (PRIVATE)                |                             |
| ITEM<br>NO.         | ESTIMATED<br>QUANTITY | F,S     | UNIT OF<br>MEASURE | ITEM                                                | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
| 26                  | 2,800                 |         | \$                 | SUPPLEMENTAL WORK                                   | \$1                        | \$2,800                     |
| 27                  | 1                     | S       | LS                 | TRAFFIC CONTROL SYSTEM                              |                            |                             |
| 28                  | 1                     |         | LS                 | TEMPORARY PAVEMENT MARKING                          |                            |                             |
| 29                  | 1                     |         | LS                 | JOB SITE MANAGEMENT                                 |                            |                             |
| 30                  | 1                     |         | LS                 | PREPARE WATER POLLUTION CONTROL PROGRAM             |                            |                             |
| 31                  | 177                   |         | TON                | SAND COVER (SEAL)                                   |                            |                             |
| 32                  | 79                    |         | TON                | POLYMER ASPHALTIC EMULSION (SEAL COAT)              |                            |                             |
| 33                  | 738                   |         | TON                | SCREENINGS (3/8)                                    |                            |                             |
| 34                  | 15                    |         | TON                | ASPHALTIC EMULSION (FLUSH COAT)                     |                            |                             |
| 35                  | 1,740                 | S       | EA                 | PAVEMENT MARKER (TYPE D)                            |                            |                             |
| 36                  | 370                   | S       | EA                 | PAVEMENT MARKER (TYPE H)                            |                            |                             |
| 37                  | 42,134                | S       | LF                 | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           |                            |                             |
| 38                  | 1,214                 | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 19) |                            |                             |
| 39                  | 19,626                | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) |                            |                             |
| 40                  | 227                   | S       | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29) |                            |                             |
| 41                  | 227                   | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 19)     |                            |                             |
| 42                  | 1,214                 | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     |                            |                             |
| 43                  | 19,626                | S       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)     |                            |                             |
| 44                  | 1                     |         | LS                 | MOBILIZATION                                        |                            |                             |
| TOTAL               | ADDITIVE 1A (IT       | EMS 2   | 6 THROUGH 4        | 4)                                                  |                            |                             |

F - Final Pay Item S - Specialty Item

#### COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C

| CONTR                                   | AOT NO. 17-23-0       | ,       |                        | From                                                | То                         |                             |
|-----------------------------------------|-----------------------|---------|------------------------|-----------------------------------------------------|----------------------------|-----------------------------|
| ADDITIVE 2A AUBERRY                     |                       | AUBERRY | GREEN MEADOW (PRIVATE) | QUAIL HOLLOW (PRIVATE)                              |                            |                             |
| ITEM<br>NO.                             | ESTIMATED<br>QUANTITY | F,S     | UNIT OF<br>MEASURE     | ITEM                                                | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
| 45                                      | 3,200                 |         | \$                     | SUPPLEMENTAL WORK                                   | \$1                        | \$3,200                     |
| 46                                      | 1                     | S       | LS                     | TRAFFIC CONTROL SYSTEM                              |                            |                             |
| 47                                      | 1                     |         | LS                     | TEMPORARY PAVEMENT MARKING                          |                            |                             |
| 48                                      | 1                     |         | LS                     | JOB SITE MANAGEMENT                                 |                            |                             |
| 49                                      | 1                     |         | LS                     | PREPARE WATER POLLUTION CONTROL PROGRAM             |                            |                             |
| 50                                      | 201                   |         | TON                    | SAND COVER (SEAL)                                   |                            |                             |
| 51                                      | 90                    |         | TON                    | POLYMER ASPHALTIC EMULSION (SEAL COAT)              |                            |                             |
| 52                                      | 835                   |         | TON                    | SCREENINGS (3/8")                                   |                            |                             |
| 53                                      | 17                    |         | TON                    | ASPHALTIC EMULSION (FLUSH COAT)                     |                            |                             |
| 54                                      | 2,386                 | s       | EA                     | PAVEMENT MARKER (TYPE D)                            |                            |                             |
| 55                                      | 47,710                | S       | LF                     | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           |                            |                             |
| 56                                      | 23,855                | S       | LF                     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) |                            |                             |
| 57                                      | 23,855                |         | LF                     | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     |                            |                             |
| 58                                      | 1                     |         | LS                     | MOBILIZATION                                        |                            |                             |
| TOTAL ADDITIVE 2A (ITEMS 45 THROUGH 58) |                       |         |                        |                                                     |                            |                             |

F - Final Pay Item S - Specialty Item

| TOTAL BID (TOTAL BASE BID + ADDITIVE BIDS 1A AND 2A (ITEMS 1 THROUGH 58) |  |
|--------------------------------------------------------------------------|--|
|                                                                          |  |

#### **EVALUATION OF BID PROPOSAL SHEETS**

Abbreviations used in the bid proposal sheet are identified in Section 1-1.06, "Abbreviations," of these special provisions.

Bids are required for the entire work. Bids will be compared on the basis indicated in the Notice to Bidders. The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

- (a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;
- (b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage-wise the unit price or item total in the Owner's Final Estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise, if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals and lump sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cents symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the items total shall prevail.

The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the Owner, and that discretion will be exercised in the manner deemed by the Owner to best protect the public interest in the prompt and economical completion of the work. The decision of the Owner respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, shall be final.

If this proposal shall be accepted and the undersigned shall fail to contract, as aforesaid, and to give the two bonds in the sums to be determined as aforesaid, with surety satisfactory to the Owner, within eight (8) days not including Saturdays, Sundays and legal holidays, after the bidder has received notice of award of the contract, the Owner, at its option, may determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this proposal shall operate and the same shall be the property of the Owner.

Proposal 3 Contract Number 17-25-C
Accompanying this proposal is security (check one only) in amount equal to at least ten percent (10%) of the total amount of the bid:

Bid Bond (); Certified Check (); Cashier's Check (); Cash (\$)

Bidder has and acknowledges the following addenda:

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last name in full.

FIRM NAME \_\_\_\_\_\_\_

Class \_\_\_\_\_ License No.\_\_\_\_ Expires \_\_\_\_

(Furnishing Contractor License information as part of this proposal is optional and is requested to facilitate verification of licensure)

Signature of Bidder

Dated

**NOTE**: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the co-partnership; and if bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

| BUSINESS ADDRESS:  |                | Zip Code |
|--------------------|----------------|----------|
| MAILING ADDRESS:   |                | Zip Code |
| BUSINESS PHONE: () | FAX NUMBER: () | •<br>    |
| EMAIL ADDRESS      |                |          |
|                    |                |          |

Proposal 4 Contract Number 17-25-C

To the Board of Supervisors, County of Fresno:

#### NONCOLLUSION AFFIDAVIT

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID \*

(Printed or Typed Name)

being first duly sworn, deposes and says that he or she is

(Owner, Partner, Corporate Officer (list title), Co-Venturer)

of \_

(Bidding Entity)

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

(Signature)

(Dated)

(Title 23 United States Code Section 112)

(Calif Public Contract Code Section 7106; Stats.1988, c. 1548, Section 1.)

\* NOTE: Completing, signing, and returning the Non-Collusion Affidavit is a required part of the Proposal. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposal 5 Contract Number 17-25-C

#### PUBLIC CONTRACT CODE

#### Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has \_\_\_\_\_\_, has not \_\_\_\_\_\_\_ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

#### Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes \_\_\_\_\_ No \_\_\_\_\_

If the answer is yes, explain the circumstances in the following space.

#### Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposal 7 Contract Number 17-25-C

#### BIDDER:

#### SUBCONTRACTORS:

The following named subcontractor(s) will perform with labor, or otherwise render services to the general contractor in or about the construction of the work or improvement in an amount in excess of **one-half of one percent of the total bid presented herewith or \$10,000, whichever is greater.** 

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board. Each listed subcontractor's name, location of business and description of work, and both their contractor's license number and public works contractor registration number, are REQUIRED, by Section 4104 of the California Public Contract Code, to be submitted prior to bid opening. (The "location of business" must specify the city in which the subcontractor's business is located, and the state if other than California.) All other requested information shall be submitted, either with the bid or within 24 hours after bid opening.

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board.

#### FAILURE TO LIST SUBCONTRACTORS AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE, OR MAY RESULT IN ASSESSMENT OF A PENALTY AGAINST THE BIDDER IN ACCORDANCE WITH SECTION 4110 OF THE CALIFORNIA PUBLIC CONTRACT CODE.

| SUBCONTRACTOR:       |                       |                      |
|----------------------|-----------------------|----------------------|
| Business Address:    |                       |                      |
| Class                | License No.           | _DIR Registration No |
| Item No. or Descript | ion of Work:          |                      |
| Dollar Amount or Pe  | rcentage of Total Bid |                      |
| Email Address        |                       |                      |
| SUBCONTRACTOR:       |                       |                      |
| Business Address:    |                       |                      |
| Class                | License No.           | _DIR Registration No |
| Item No. or Descript | ion of Work:          |                      |
| Dollar Amount or Pe  | rcentage of Total Bid |                      |
| Email Address        |                       |                      |
| Proposal 8(a)        |                       |                      |

Contract Number 17-25-C

| BIDDER:          |                         |                      |
|------------------|-------------------------|----------------------|
| SUBCONTRACTO     | DR:                     |                      |
| Business Address | S:                      |                      |
| Class            | License No.             | DIR Registration No. |
| Item No. or Desc | ription of Work:        |                      |
| Dollar Amount or | Percentage of Total Bid |                      |
| Email Address    |                         |                      |
| SUBCONTRACTO     | PR:                     |                      |
| Business Address | S:                      |                      |
| Class            | License No              | DIR Registration No. |
| Item No. or Desc | ription of Work:        |                      |
| Dollar Amount or | Percentage of Total Bid |                      |
| Email Address    |                         |                      |
| SUBCONTRACTO     | )R:                     |                      |
| Business Addres  | S:                      |                      |
| Class            | License No              | DIR Registration No. |
| Item No. or Desc | ription of Work:        |                      |
| Dollar Amount or | Percentage of Total Bid |                      |
| Email Address    |                         |                      |
| SUBCONTRACTO     | )R:                     |                      |
| Business Addres  | S:                      |                      |
| Class            | License No.             | DIR Registration No. |
| Item No. or Desc | ription of Work:        |                      |
| Dollar Amount or | Percentage of Total Bid |                      |
| Email Address    |                         |                      |

Proposal 8(b) Contract Number 17-25-C

#### OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

You may opt out of the payment adjustments for price index fluctuations as specified in Section 2-1.31, "OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS," of the special provisions.

You can only elect to opt out of payment adjustments for price index fluctuations of if you complete this form and submit it <u>with your bid</u>. The individual signing this form must be duly authorized to sign a bid.

## By signing this form, I hereby opt out of the payment adjustments for price index fluctuations for the above-named project.

| Bidder:           |  |  |
|-------------------|--|--|
| Name (Printed): _ |  |  |
| Signature:        |  |  |
| Title:            |  |  |

Proposal 15 Contract Number: 17-25-C

(This guaranty shall be executed by the successful bidder in accordance with instructions in the special provisions. The bidder may execute the guaranty on this page at the time of submitting his bid.)

#### GUARANTY

To the Owner: County of Fresno

#### **BITUMINOUS SEAL COATS**

#### CONTRACT NUMBER: 17-25-C

The undersigned guarantees the construction and installation of the following work included in this project:

#### ALL WORK

Should any of the materials or equipment prove defective or should the work as a whole prove defective, due to faulty workmanship, material furnished or methods of installation, or should the work or any part thereof fail to operate properly as originally intended and in accordance with the plans and specifications, due to any of the above causes, all within twelve (12) months after date on which this contract is accepted by the Owner, the undersigned agrees to reimburse the Owner, upon demand, for its expenses incurred in restoring said work to the condition contemplated in said project, including the cost of any such equipment or materials replaced and the cost of removing and replacing any other work necessary to make such replacement or repairs, or, upon demand by the Owner, to replace any such material and to repair said work completely without cost to the Owner so that said work will function successfully as originally contemplated.

The Owner shall have the unqualified option to make any needed replacement or repairs itself or to have such replacements or repairs done by the undersigned. In the event the Owner elects to have said work performed by the undersigned, the undersigned agrees that the repairs shall be made and such materials as are necessary shall be furnished and installed within a reasonable time after the receipt of demand from the Owner.

Date:

Contractor:

Proposal – 16 Contract Number: 17-25-C

#### AGREEMENT

THIS AGREEMENT made at Fresno, in Fresno County, California, by and between hereinafter called the Contractor, and the <u>County of Fresno</u>

hereinafter called the Owner.

WITNESSETH: That the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

**ARTICLE I.** The Contractor agrees to furnish all labor and materials, including tools, implements, and appliances required, but excluding such materials as are mentioned in the specifications to be furnished by the Owner, and to perform all the work in a good and workmanlike manner, free from any and all liens and claims of mechanics, materialmen, teamsters, subcontractors, artisans, machinists, and laborers required for:

#### BITUMINOUS SEAL COATS

#### VARIOUS LOCATIONS IN FRESNO COUNTY

#### CONTRACT NUMBER: 17-25-C

All in strict compliance with the plans, drawings and specifications therefor prepared by the Owner, and other contract documents relating thereto.

**ARTICLE II.** The Contractor and the Owner agree that the Notice to Bidders and Special Provisions, the Wage Scale (Prevailing Wages), the Plans and Drawings, Addenda and Bulletins thereto, and the Proposal (Bid Book) hereto attached, together with this Agreement, form the contract, and they are as fully a part of the contract as if hereto attached or herein repeated.

All portions of the Standard Specifications of the State of California, Department of Transportation, dated 2015, which are not in conflict with this contract shall be deemed a part of the specifications as though fully therein set forth; provided, however, that revisions to the said Standard Specifications shall apply only to the extent, if any, included in the Project Details of these specifications or as otherwise incorporated directly herein. No part of said specifications which is in conflict with any portion of this agreement, or which is not actually descriptive of the work to be done thereunder, or of the manner in which said work is to be executed, shall be considered as any part of this agreement, but shall be utterly null and void.

**ARTICLE IV.** If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors should persistently violate any of the provisions of the contract, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he

should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Engineer, then the Owner may, upon certificate of the Engineer when sufficient cause exists to justify such action, serve written notice upon the Contractor and his surety of its intention to terminate the contract, and unless within five days after the serving of such notice, such violations shall cease and satisfactory arrangements for correction thereof be made, the contract shall, upon the expiration of said five days, cease and terminate.

In the event of any such termination, the Owner shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract, provided, however, that if the surety within ten (10) days after the serving upon it of notice of termination does not give the Owner written notice of its intention to take over and perform the contract or does not commence performance thereof within the ten (10) days stated above from the date of the serving of such notice, the Owner may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and his surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the work and necessary therefor. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner, as herein provided and damage incurred through the Contractor's default, shall be certified by the Engineer.

**ARTICLE V.** With respect to any work required to be done under this contract, the Contractor will indemnify and hold harmless the COUNTY OF FRESNO and all other participating public agencies, whether or not said agencies are named herein, who have jurisdiction within the areas in which the work is to be performed, and all officers and employees of the Owner, the County, the State, the United States and said other participating agencies, from any and all costs and expenses, attorney fees and court costs, damages, liabilities, claims and losses occurring or resulting to COUNTY in connection with the performance, or failure to perform, by CONTRACTOR, its officers, agents or employees under this Agreement, and from any and all costs and expenses, attorney fees and court costs, damages, liabilities, claims and losses occurring or resulting to any person, firm or corporation who may be injured or damaged by the performance, or failure to perform, of CONTRACTOR, its officers, agents or employees under this Agreement. In addition, CONTRACTOR agrees to indemnify COUNTY for Federal, State of California and/or local audit exceptions resulting from non-compliance herein on the part of CONTRACTOR.

CONTRACTOR agrees to indemnify, save, hold harmless, and at COUNTY'S request, defend the COUNTY, its officers, agents, and employees from any and all costs and expenses, damages, liabilities, claims, and losses occurring or resulting to COUNTY in connection with the performance, or failure to perform, by CONTRACTOR, its officers, agents, or employees under this Agreement, and from any and all costs and expenses, damages, liabilities, claims, and losses occurring or resulting to any person, firm, or corporation who may be injured or damaged by the performance, or failure to perform, of CONTRACTOR, its officers, agents, or employees under this Agreement.

The Certificate of Insurance shall be issued in duplicate, to the COUNTY OF FRESNO and all other participating agencies, whether or not said agencies are named herein, who contribute to the cost of the work or have jurisdiction over areas in which the work is to be performed and all officers and employees of said agencies while acting within the course and scope of their duties and responsibilities.

In the event CONTRACTOR fails to keep in effect at all times insurance coverage as herein provided, the COUNTY may, in addition to other remedies it may have, suspend or terminate this Agreement upon the occurrence of such event.

All policies shall be with admitted insurers licensed to do business in the State of California. Insurance purchased shall be purchased from companies possessing a current A.M Best Company rating of A FSC VII or better.

Without limiting the COUNTY'S right to obtain indemnification from CONTRACTOR or any third parties, CONTRACTOR, at its sole expense, shall maintain in full force and effect, the following insurance policies or a program of self-insurance, including but not limited to, an insurance pooling arrangement or Joint Powers Agreement (JPA) throughout the term of the Agreement:

#### A. Commercial General Liability

Commercial General Liability Insurance with limits not less than those shown in the following table: Liability Insurance Requirements

| Total bid      | For each<br>occurrence <sup>a</sup><br>Aggregate for<br>products/completed<br>operation |             | General aggregate <sup>b</sup> | Umbrella or excess liability <sup>c</sup> |  |  |
|----------------|-----------------------------------------------------------------------------------------|-------------|--------------------------------|-------------------------------------------|--|--|
| ≤ \$1,000,000  | \$1,000,000                                                                             | \$2,000,000 | \$2,000,000                    | \$5,000,000                               |  |  |
| > \$1,000,000  |                                                                                         |             |                                |                                           |  |  |
| ≤ \$10,000,000 | \$1,000,000                                                                             | \$2,000,000 | \$2,000,000                    | \$10,000,000                              |  |  |
| > \$10,000,000 |                                                                                         |             |                                |                                           |  |  |
| ≤ \$25,000,000 | \$2,000,000                                                                             | \$2,000,000 | \$4,000,000                    | \$15,000,000                              |  |  |
| > \$25,000,000 | \$2,000,000                                                                             | \$2,000,000 | \$4,000,000                    | \$25,000,000                              |  |  |

<sup>a</sup>Combined single limit for bodily injury and property damage.

<sup>b</sup>This limit must apply separately to your work under this Contract.

<sup>c</sup>The umbrella or excess policy must contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

This policy shall be issued on a per occurrence basis. COUNTY may require specific coverages including completed operations, products liability, contractual liability, Explosion-Collapse-Underground, fire legal liability, or any other liability insurance deemed necessary because of the of the nature of this contract.

Such Commercial General Liability insurance shall name the County of Fresno, its officers, agents, and employees, individually and collectively, as additional insured, but only insofar as the operations under this Agreement are concerned. Such coverage for additional insured shall apply as primary insurance and any other insurance, or self-insurance, maintained by COUNTY, its officers, agents and employees shall be excess only and not contributing with insurance provided under CONTRACTOR's policies herein. This insurance shall not be cancelled or changed without a minimum of thirty (30) days advance written notice given to COUNTY. CONTRACTOR shall obtain endorsements to the Commercial General Liability insurance policy naming COUNTY as an additional insured and providing for a thirty (30) day prior written notice of cancellation or change in terms or coverage.

Within eight (8) days from date CONTRACTOR executes this Agreement, CONTRACTOR shall provide certificates of insurance and endorsement as stated above for all of the foregoing policies, as required herein, to the County of Fresno, Design Engineer, 2220 Tulare Street, Fresno, CA 93721, stating that such insurance coverages have been obtained and are in full force; that the County of Fresno, its officers, agents and employees will not be responsible for an premiums on the policies; that such Commercial General Liability insurance names the County of Fresno, its officers, agents, and employees, individually and collectively, as additional insured, but only insofar as the operations under this Agreement are

#### Contract Number 17-25-C

concerned; that such coverage for additional insured shall apply as primary insurance an any other insurance, or self- insurance shall not be cancelled or changed without a minimum of thirty (30) days advance, written notice given to COUNTY.

CONTRACTOR shall obtain endorsements to the Commercial General Liability insurance naming the County of Fresno, its officers, agents, and employees, individually and collectively, as additional insured, but only insofar as the operations under this Agreement are concerned. Such coverage for additional insured shall apply as primary insurance and any other insurance, or self-insurance, maintained by COUNTY, its officers, agents, and employees shall be excess only and not contributing with insurance provided under CONTRACTOR'S policies herein. This insurance shall not be cancelled or changed without a minimum or thirty (30) days advance written notice given to COUNTY.

#### B. Automobile Liability

Comprehensive Automobile Liability Insurance with limits of not less than One Million Dollars (\$1,000,000) per accident for bodily injury and property damage. Coverage should include owned and non-owned vehicles used in connection with this Agreement and all applicable endorsements.

#### C. Professional Liability

If CONTRACTOR is a licensed professional or employs professional staff, (e.g., Architect, Engineer, Surveyor, etc.) in providing services, Professional Liability Insurance with limits of not less than One Million Dollars (\$1,000,000.00) per occurrence, Three Million Dollars (\$3,000,000.00) annual aggregate with a provision for 3 year tail coverage.

#### D. Worker's Compensation

A policy of Worker's Compensation insurance as may be required by the California Labor Code.

**ARTICLE VI.** Contractor represents that he has secured the payment of Worker's Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the work contemplated herein will continue so to comply with said provisions of said Code. Contractor shall supply the Owner with certificates of insurance, in duplicate, evidencing that Worker's Compensation Insurance is in effect and providing that the Owner will receive ten days notice of cancellation. If Contractor self-insures Worker's Compensation, Certificate of Consent to Self-insure should be provided the Owner.

**ARTICLE VII.** The Contractor shall forthwith furnish in duplicate, a faithful performance bond in an amount equal to 100% of the contract price and a payment bond in an amount equal to 100% of the contract price, both bonds to be written by a surety company acceptable to the Owner and in the form prescribed by law.

The payment bond shall contain provisions such that if the Contractor or his subcontractors shall fail to pay (a) amounts due under the Unemployment Insurance Code with respect to work performed under the contract, or (b) any amounts required to be deducted, withheld and paid over to the Employment Development Department and to the Franchise Tax Board from the wages of the employees of the Contractor and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code with respect to such work and labor, then the surety will pay these amounts. In case suit is brought upon the payment bond, the surety will pay a reasonable attorney's fee to be fixed by the court.

**ARTICLE VIII.** This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

Except as provided in Labor Code section 1725.5(f), no contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations

#### **Contract Number 17-25-C**

pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

Except as provided in Labor Code section 1725.5(f), no contractor or subcontractor may be awarded a contract for public work on a public works project or engage in the performance of work on any public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

Contractor shall comply with all applicable laws and regulations relating to wages and employment, including all requirements imposed by the California Department of Industrial Relations (DIR). Contractor shall cooperate with County to furnish timely all information necessary for County's completion of the form required to be submitted by County when registering the Project on the DIR website; and County thereafter shall provide to Contractor the "Project ID Number" assigned by DIR in order to facilitate Contactor's submission to DIR of its certified payrolls for the Project, in the manner required and using such form as may be prescribed by DIR, in accordance with the provisions of Labor Code section 1771.4(a)(3).

**ARTICLE IX** Governing Law – Venue for any action arising out of or relating to this Agreement shall be in Fresno County, California. This Agreement shall be governed by the laws of the State of California

This Contract, 17-30-C was awarded by the Board of Supervisors on <u>May 8, 2018</u>. It has been reviewed by the Department of Public Works and Planning and is in proper order for signature of the Chairman of the Board of Supervisors.

| IN WITNESS WHEREOF, they have executed this                                                                                                                                                       | Agreement this day of                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| June, 2018                                                                                                                                                                                        |                                                                                |
| COUNTY OF FRESNO<br>(OWNER)                                                                                                                                                                       | SIERRA NEVAMA CONSTRUCTION, INC.<br>(CONTRACTOR)                               |
| By Sal Quintero, Chairman<br>of the Board of Supervisors of the<br>County of Fresno<br>ATTEST:<br>Bernice E. Seidel<br>Clerk to the Board of Supervisors<br>County of Fresno, State of California | 88-0245093   (Taxpayer Federal I.D. No.)   By MARC   MARC MARKWELL   Title CFO |

By <u>Susan k</u> Depu

# COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C

| Sierra | Nevada |
|--------|--------|
| #      |        |

| BASE E      | BASE BID (LOCATIONS 1 THROUGH 10)   |     |                    |                                                      |                            |                             |
|-------------|-------------------------------------|-----|--------------------|------------------------------------------------------|----------------------------|-----------------------------|
| ITEM<br>NO. | ESTIMATED<br>QUANTITY               | F,S | UNIT OF<br>MEASURE | ITEM                                                 | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
| 1           | 20,700                              |     | \$                 | SUPPLEMENTAL WORK                                    | \$1                        | \$20,700                    |
| 2           | 1                                   | s   | LS                 | TRAFFIC CONTROL SYSTEM                               | 375,306.60                 | 375,306.60                  |
| 3           | 1                                   |     | LS                 | TEMPORARY PAVEMENT MARKING                           | 2,000.00                   | 2,000.00                    |
| 4           | 1                                   |     | LS                 | JOB SITE MANAGEMENT                                  | 1,000.00                   | 1,000.00                    |
| 5           | 1                                   | ,   | LS                 | PREPARE WATER POLLUTION CONTROL PROGRAM              | 1,200.00                   | 1,200.00                    |
| 6           | 1,298                               |     | TON                | SAND COVER (SEAL)                                    | 12.00                      | 15,576.00                   |
| 7           | 581                                 |     | TON                | POLYMER ASPHALTIC EMULSION (SEAL COAT)               | 250.00                     | 145,250.00                  |
| 8           | 5,395                               |     | TON                | SCREENINGS (3/8")                                    | 45.00                      | 242,775.0                   |
| 9           | 113                                 |     | TON                | ASPHALTIC EMULSION (FLUSH COAT)                      | 400.00                     | 45,200.00                   |
| 10          | 18                                  | s   | EA                 | PAVEMENT MARKER (TYPE D)                             | 5.00                       | 90.00                       |
| 11          | 4,000                               | S   | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 27B) | 0.70                       | 2,800.00                    |
| 12          | 131,757                             | S   | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 5)   | 0.43                       | 56,655.5                    |
| 13          | 23,200                              | S   | LF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 18)  | 1.00                       | 23,200.00                   |
| 14          | 200                                 | s   | SF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 28)  | 3.00                       | 600.00                      |
| 15          | 200                                 | s   | SF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29)  | 3.00                       | 600.00                      |
| 16          | 22                                  | S   | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP)                | 8.00                       | 176.00                      |
| 17          | 954                                 | S   | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP AHEAD)          | 8.00                       | 7,632.00                    |
| 18          | 253                                 | S   | SF                 | THERMOPLASTIC PAVEMENT MARKING (STOP BAR)            | 8.00                       | 2,024.00                    |
| 19          | 55                                  | S   | SF                 | THERMOPLASTIC PAVEMENT MARKING (YIELD AHEAD)         | 8.00                       | 440.00                      |
| 20          | 236                                 | S   | SF                 | REMOVE THERMOPLASTIC PAVEMENT MARKING                | 5.00                       | 1,180.00                    |
| 21          | 40,738                              | S   | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 5)       | 0.28                       | 11,406.64                   |
| 22          | 6,400                               | S   | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 18)      | 0.40                       | 2,560.00                    |
| 23          | 200                                 | S   | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 28)      | 0.40                       | 80.00                       |
| 24          | 200                                 | S   | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)      | 0.40                       | 80.00                       |
| 25          | 1                                   |     | LS                 | MOBILIZATION                                         | 150,000.00                 | 150,000.00                  |
| TOTAL       | ГОТАL BASE BID (ITEMS 1 THROUGH 25) |     |                    |                                                      |                            | 531.75                      |

F - Final Pay Item S - Specialty Item

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COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C

|        |                 |       |             | From                                                |              |              |   |
|--------|-----------------|-------|-------------|-----------------------------------------------------|--------------|--------------|---|
| ADDITI | VE 1A           | I     |             | MILLERTON (WEST)                                    | LITEM PRICE  |              | 1 |
| NO.    | QUANTITY        | F,S   | MEASURE     | ITEM                                                | (IN FIGURES) | (IN FIGURES) |   |
| 26     | 2,800           |       | \$          | SUPPLEMENTAL WORK                                   | \$1          | \$2,800      |   |
| 27     | 1               | S     | LS          | TRAFFIC CONTROL SYSTEM                              | 35,000.00    | 35,000.00    |   |
| 28     | 1               |       | LS          | TEMPORARY PAVEMENT MARKING                          | 1,000.00     | 1,000.00     |   |
| 29     | 1               |       | LS          | JOB SITE MANAGEMENT                                 | 500.00       | 500.00       |   |
| 30     | 1               |       | LS          | PREPARE WATER POLLUTION CONTROL PROGRAM             | 260.00       | 250.00       |   |
| 31     | 177             |       | TON         | SAND COVER (SEAL)                                   | 12.00        | 2,124.00     |   |
| 32     | 79              |       | TON         | POLYMER ASPHALTIC EMULSION (SEAL COAT)              | 250.00       | 19,750.00    |   |
| 33     | 738             |       | TON         | SCREENINGS (3/8)                                    | 45.00        | 33,210.00    |   |
| 34     | 15              |       | TON         | ASPHALTIC EMULSION (FLUSH COAT)                     | 400.00       | 6,000.00     |   |
| 35     | 1,740           | S     | EA          | PAVEMENT MARKER (TYPE D)                            | 4.50         | 7,830.00     |   |
| 36     | 370             | S     | EA          | PAVEMENT MARKER (TYPE H)                            | 4.50         | 1,665.00     |   |
| 37     | 42,134          | S     | LF          | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           | 0.25         | 10,533.50    |   |
| 38     | 1,214           | S     | LF          | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 19) | 1.00         | 1,214.00     |   |
| 39     | 19,626          | S     | LF          | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) | 1.45         | 28,457.70    |   |
| 40     | 227             | S     | LF          | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29) | 3.00         | 621.00       |   |
| 41     | 227             | S     | LF          | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 19)     | 0.40         | 90.80        |   |
| 42     | 1,214           | S     | LF          | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     | 0.40         | 485.60       |   |
| 43     | 19,626          | S     | LF          | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)     | 0.40         | 7,850.40     |   |
| 44     | 1               |       | LS          | MOBILIZATION                                        | 12,000.00    | 12,000.00    |   |
| TOTAL  | ADDITIVE 1A (IT | EMS 2 | 6 THROUGH 4 | 4)                                                  | \$171,44     | 2.00         |   |

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F - Final Pay Item S - Specialty Item

COUNTY OF FRESNO DEPARTMENT OF PUBLIC WORKS AND PLANNING PROJECT: BITUMINOUS SEAL COATS CONTRACT NO: 17-25-C

|             |                       |       |                    | From                                                | То                         |                             |           |
|-------------|-----------------------|-------|--------------------|-----------------------------------------------------|----------------------------|-----------------------------|-----------|
| ADDITI      | VE 2A                 |       | AUBERRY            | GREEN MEADOW (PRIVATE)                              | QUAIL HOLLOW               | (PRIVATE)                   |           |
| ITEM<br>NO. | ESTIMATED<br>QUANTITY | F,S   | UNIT OF<br>MEASURE | ITEM                                                | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) | ]         |
| 45          | 3,200                 |       | \$                 | SUPPLEMENTAL WORK                                   | \$1                        | \$3,200                     |           |
| 46          | 1                     | S     | LS                 | TRAFFIC CONTROL SYSTEM                              | 40,000.00                  | 40,000.00                   | ]         |
| 47          | 1                     |       | LS                 | TEMPORARY PAVEMENT MARKING                          | 1,000.00                   | 1,000.00                    | ]         |
| 48          | 1                     |       | LS                 | JOB SITE MANAGEMENT                                 | 500.00                     | 500.00                      |           |
| 49          | 1                     |       | LS                 | PREPARE WATER POLLUTION CONTROL PROGRAM             | 250.00                     | 250.00                      |           |
| 50          | 201                   |       | TON                | SAND COVER (SEAL)                                   | 12.00                      | 2,412.00                    |           |
| 51          | 90                    |       | TON                | POLYMER ASPHALTIC EMULSION (SEAL COAT)              | 250.00                     | 22,500.00                   | }         |
| 52          | 835                   |       | TON                | SCREENINGS (3/8")                                   | 45.00                      | 37,575.00                   | }         |
| 53          | 17                    |       | TON                | ASPHALTIC EMULSION (FLUSH COAT)                     | 400.00                     | 6,800.00                    |           |
| 54          | 2,386                 | S     | EA                 | PAVEMENT MARKER (TYPE D)                            | 4.50                       | 10,737.00                   |           |
| 55          | 47,710                | S     | LF                 | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           | 0.25                       | 11,927.50                   |           |
| 56          | 23,855                | S     | ĹF                 | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) | 1.45                       | 34.589.75                   | ł         |
| 57          | 23,855                |       | LF                 | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     | 0.40                       | 9,542.00                    |           |
| 58          | 1                     |       | LS                 | MOBILIZATION                                        | 14,000.00                  | 14,000.0                    |           |
| TOTAL       | ADDITIVE 2A (IT       | EMS 4 | 5 THROUGH 5        | 8)                                                  | \$ 195.0                   | 33.25                       | $\bigvee$ |

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F - Final Pay Item S - Specialty Item

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| TOTAL BID (TOTAL BASE BID + ADDITIVE BIDS 1A AND 2A (ITEMS 1 THROUGH 58) | * | ۱, | 475,007.00 | $\vee$ |
|--------------------------------------------------------------------------|---|----|------------|--------|
|                                                                          |   |    |            | ,      |

#### EVALUATION OF BID PROPOSAL SHEETS

Abbreviations used in the bid proposal sheet are identified in Section 1-1.06, "Abbreviations," of these special provisions.

Bids are required for the entire work. Bids will be compared on the basis indicated in the Notice to Bidders. The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

- (a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;
- (b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage-wise the unit price or item total in the Owner's Final Estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise, if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals and lump sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cents symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the items total shall prevail.

The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the Owner, and that discretion will be exercised in the manner deemed by the Owner to best protect the public interest in the prompt and economical completion of the work. The decision of the Owner respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, shall be final.

If this proposal shall be accepted and the undersigned shall fail to contract, as aforesaid, and to give the two bonds in the sums to be determined as aforesaid, with surety satisfactory to the Owner, within eight (8) days not including Saturdays, Sundays and legal holidays, after the bidder has received notice of award of the contract, the Owner, at its option, may determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this proposal shall operate and the same shall be the property of the Owner.

#### Proposal 3 Contract Number 17-25-C

Accompanying this proposal is security (check one only) in amount equal to at least ten percent (10%) of the total amount of the bid:

Bid Bond (); Certified Check (); Cashier's Check (); Cash (\$)

Bidder has and acknowledges the following addenda:

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last name in full.

FIRM NAME Sierra Nevada Construction, Inc., a Nevada corporation

Kevin L. Robertson, President

Craig D. Holt, Vice. President

Marc T. Markwell, Secretary Treasurer

Licensed in accordance with an act providing for the registration of Contractors, Class A License No. 593393 Expires 05/31/2018

(Furnishing Contractor License information as part of this proposal is optional and is requested to facilitate verification of licensure)

April 10,2018 Dated

Marc T. Markwell, Secretary/Treasurer

**NOTE:** If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the co-partnership; and if bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

| BUSINESS ADDRESS: 2055 E. Greg Street, Sparks, NV 8943   | 31       |
|----------------------------------------------------------|----------|
| <b>J</b>                                                 | Zip Code |
| MAILING ADDRESS: P.O. BOX 50700, Sparks, NV 89435        |          |
|                                                          | Zip Code |
| BUSINESS PHONE: (115) 355 - 0420 FAX NUMBER: (115) 355 - | 0535     |
| EMAIL ADDRESS bids@ Snc.biz                              |          |
| Proposal 4                                               |          |

Contract Number 17-25-C

#### ACTION BY UNANIMOUS WRITTEN CONSENT OF THE BOARD OR DIRECTORS AND SHAREHOLDERS OF SIERRA NEVADA CONSTRUCTION, INC.

#### January 1, 2016

The undersigned, being all of the directors and shareholders of Sierra Nevada Construction, Inc., a Nevada corporation (the "Corporation"), do hereby unanimously approve, adopt, make, ratify and confirm the following:

WHEREAS, Kevin L. Robertson acts in the capacity of President, Craig D. Holt acts in the capacity of Vice President, and Marc Markwell acts in the capacity of Treasure, Chief Financial Officer, and Secretary of Sierra Nevada Construction, Inc.

WHEREAS, Kevin L. Robertson, Craig D. Holt, and Marc Markwell as officers of this Corporation may be required from time to time to execute agreements on behalf on Sierra Nevada Construction, Inc.

NOW THEREFORE, the undersigned directors and shareholders of Sierra Nevada Construction, Inc., resolve as follows:

RESOLVED, that the following individuals are appointed to serve as officers of this Corporation in the specified capacities:

| Kevin L. Robertson | President                                   |
|--------------------|---------------------------------------------|
| Craig D. Holt      | Vice President                              |
| Marc Markwell      | Chief Financial Officer/Secretary/Treasurer |

RESOLVED, that Kevin L. Robertson, Craig D. Holt and Marc T. Markwell as officers of this Corporation are authorized to execute agreements into, between or among Sierra Nevada Construction, Inc., and third parties without further authorization from the directors and/or shareholders.

and, further

RESOLVED, that Kevin L. Robertson, Craig D. Holt and Marc T. Markwell in their capacities as officers of this Corporation are authorized to take all necessary and appropriate steps on behalf of the Corporation to effectuate the proposed amendments to the Articles of Incorporation and the Bylaws of the Corporation.

IN WITNESS WHEREOF, the directors and shareholders have executed this instrument effective January 1, 2016

Directors:

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Shareholders:

 $\frac{C_{-1} \cdot b_{\text{ext}}}{Craig D. Holt}$   $\frac{\mathcal{L} - \mathcal{L} \mathcal{L}}{Kevin L. Robertson}$ 

C-j D. Hart Craig D. Holt

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Kevin L. Robertson

To the Board of Supervisors, County of Fresno:

#### NONCOLLUSION AFFIDAVIT

#### TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID \*

### Marc T. Markwell

(Printed or Typed Name)

being first duly sworn, deposes and says that he or she is

Secretary / Treasurer (Owner, Partner, Corporate Officer (list title), Co-Venturer)

## of Sierra Nevada Construction, Inc. (Bidding Entity)

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

(Signature) Marc T. Markwell, Secretary/Treasurer

(Title 23 United States Code Section 112)

(Calif Public Contract Code Section 7106; Stats. 1988, c. 1548, Section 1.)

\* NOTE: Completing, signing, and returning the Non-Collusion Affidavit is a required part of the Proposal. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

April 10, 2018 (Dated)

Proposal 5 **Contract Number 17-25-C** 

#### PUBLIC CONTRACT CODE

#### Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has \_\_\_\_\_, has not  $\checkmark$  been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposal 6 Contract Number 17-25-C

#### Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes \_\_\_\_\_ No \_

If the answer is yes, explain the circumstances in the following space.

#### Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposal 7 Contract Number 17-25-C

## BIDDER: Sierra Nevada Construction. Inc.

#### SUBCONTRACTORS:

The following named subcontractor(s) will perform with labor, or otherwise render services to the general contractor in or about the construction of the work or improvement in an amount in excess of **one-half of one percent of the total bid presented herewith or \$10,000, whichever is greater.** 

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board. Each listed subcontractor's name, location of business and description of work, and both their contractor's license number and public works contractor registration number, are REQUIRED, by Section 4104 of the California Public Contract Code, to be submitted prior to bid opening. (The "location of business" must specify the city in which the subcontractor's business is located, and the state if other than California.) All other requested information shall be submitted, either with the bid or within 24 hours after bid opening.

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board.

FAILURE TO LIST SUBCONTRACTORS AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE, OR MAY RESULT IN ASSESSMENT OF A PENALTY AGAINST THE BIDDER IN ACCORDANCE WITH SECTION 4110 OF THE CALIFORNIA PUBLIC CONTRACT CODE.

| SUBCONTRACTOR:          | Chrisp Company                                               |
|-------------------------|--------------------------------------------------------------|
| Business Address: _     | 1001 Stokes Ave. STOCKTON. 04. 95215                         |
| Class A CI3 C32         | License No. 374600 DIR Registration No. 100000306            |
| Item No. or Description | n of Work: Removal + Install or Striping, Markings & Markers |
| Dollar Amount or Per    | entage of Total Bid7.2 7.                                    |
| Email Address 57        | rommel & Chrispep.com                                        |
| SUBCONTRACTOR:          |                                                              |
| Business Address: _     |                                                              |
| Class                   | License NoDIR Registration No                                |
| Item No. or Description | n of Work:                                                   |
| Dollar Amount or Per    | entage of Total Bid                                          |
| Email Address           |                                                              |
| Bronocal 8(a)           |                                                              |

Proposal 8(a) Contract Number 17-25-C

| BIDDER: Sjerra Nevada Construction, Inc.                  |                                        |  |
|-----------------------------------------------------------|----------------------------------------|--|
| SUBCONTRACTOR:                                            |                                        |  |
| Business Address:                                         |                                        |  |
| ClassLicense No                                           | DIR Registration No                    |  |
| Item No. or Description of Work:                          |                                        |  |
| Dollar Amount or Percentage of Total Bid                  |                                        |  |
| Email Address                                             |                                        |  |
| SUBCONTRACTOR:                                            |                                        |  |
| Business Address:                                         |                                        |  |
| ClassLicense No                                           | DIR Registration No                    |  |
| Item No. or Description of Work:                          | ······································ |  |
| Dollar Amount or Percentage of Total Bid                  |                                        |  |
| Email Address                                             |                                        |  |
| SUBCONTRACTOR:                                            |                                        |  |
| Business Address:                                         |                                        |  |
| ClassLicense No                                           | DIR Registration No                    |  |
| Item No. or Description of Work:                          |                                        |  |
| Dollar Amount or Percentage of Total Bid                  |                                        |  |
| Email Address                                             |                                        |  |
| SUBCONTRACTOR:                                            |                                        |  |
| Business Address:                                         |                                        |  |
| ClassLicense No                                           | DIR Registration No                    |  |
| Item No. or Description of Work:                          |                                        |  |
| Dollar Amount or Percentage of Total Bid<br>Email Address |                                        |  |

Proposal 8(b) Contract Number 17-25-C

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#### OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

You may opt out of the payment adjustments for price index fluctuations as specified in Section 2-1.31, "OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS," of the special provisions.

You can only elect to opt out of payment adjustments for price index fluctuations of if you complete this form and submit it with your bid. The individual signing this form must be duly authorized to sign a bid.

#### By signing this form, I hereby opt out of the payment adjustments for price index fluctuations for the above-named project.

Bidder: \_\_\_\_\_

| Name (Printed): _ |  |
|-------------------|--|
|                   |  |
| Signature:        |  |
|                   |  |
| Title             |  |
| Tiue.             |  |

Proposal 15 Contract Number: 17-25-C (This guaranty shall be executed by the successful bidder in accordance with instructions in the special provisions. The bidder may execute the guaranty on this page at the time of submitting his bid.)

GUARANTY

To the Owner: County of Fresno

#### BITUMINOUS SEAL COATS

#### CONTRACT NUMBER: 17-25-C

The undersigned guarantees the construction and installation of the following work included in this project:

#### ALL WORK

Should any of the materials or equipment prove defective or should the work as a whole prove defective, due to faulty workmanship, material furnished or methods of installation, or should the work or any part thereof fail to operate properly as originally intended and in accordance with the plans and specifications, due to any of the above causes, all within twelve (12) months after date on which this contract is accepted by the Owner, the undersigned agrees to reimburse the Owner, upon demand, for its expenses incurred in restoring said work to the condition contemplated in said project, including the cost of any such equipment or materials replaced and the cost of removing and replacing any other work necessary to make such replacement or repairs, or, upon demand by the Owner, to replace any such material and to repair said work completely without cost to the Owner so that said work will function successfully as originally contemplated.

The Owner shall have the unqualified option to make any needed replacement or repairs itself or to have such replacements or repairs done by the undersigned. In the event the Owner elects to have said work performed by the undersigned, the undersigned agrees that the repairs shall be made and such materials as are necessary shall be furnished and installed within a reasonable time after the receipt of demand from the Owner.

Sierra Nevada Construction, Inc.

T. Markwett, Secretary / Treasurer

Date: April 10,2018

Contractor:

Proposal – 16 Contract Number: 17-25-C



SIERRA NEVADA CONSTRUCTION, IM

| Mail         | PO Box 50760<br>Sparks, NV 89435-0760             |
|--------------|---------------------------------------------------|
| Yard         | 8621 Morrison Creek Drive<br>Sacramento, CA 95828 |
| Phone<br>Fax | 916.387.9619<br>916.387.9620                      |

NV lic. 25565 CA lic. 593393

County of Fresno

April 10, 2018

RE: Bituminous Seal Coats

I, Marc T. Markwell, Secretary / Treasurer of Sierra Nevada Construction, Inc., authorize signature and withdrawal of a bid authority to <u>Jorge Martinez</u>, acting as an agent for Sierra Nevada Construction, Inc. for the above referenced project.

Sincerely,

SIERRA NEVADA CONSTRUCTION, INC.

Marc T. Markwell Secretary / Treasurer
## THE AMERICAN INSTITUTE OF ARCHITECTS

r<sup>24,</sup>

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| AIA Document A310<br>Bid Bond                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KNOW ALL MEN BY THESE PRESENTS, THAT WE Sierra Nevada Construction, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                    |
| as Principal, hereinafter called the Principal, and Liberty Mutual Insurance Company                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ý                                                                                                                                                                                                  |
| a corporation duly organized under the laws of the State ofMassachusetts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                    |
| as Surety, hereinafter called the Surety, are held and firmly bound unto <u>County of Fresno</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | การเริ่ม เอกระชุม - เราะหลางการคุณที่เอาที่ได้ได้เกิดการแบบเป็นไหว่าง เราะห                                                                                                                        |
| as Obligee, hereinafter called the Obligee, in the sum of Ten percent of attached bid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                    |
| Dollars (\$ **10%** of attached bid<br>for the payment of which sum well and truly to be made, the said Principal and the said Surety, b<br>executors, administrators, successors and assigns, jointly and severally, firmly by these presents.<br>WHEREAS, the Principal has submitted a bid for <u>Bituminous Seal Coats, Contract No. 17-2</u>                                                                                                                                                                                                                                                                                                                                                                                                        | ),<br>bind ourselves, our heirs,<br>5-C                                                                                                                                                            |
| NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall e<br>the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be s<br>Contract Documents with good and sufficient surety for the faithful performance of such Cont<br>payment of labor and materials furnished in the prosecution thereof, or in the event of the failure<br>such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the differ<br>penalty hereof between the amount specified in said bid and such larger amount for which the O<br>contract with another party to perform the Work covered by said bid, then this obligation shall be<br>to remain in full force and effect. | nter into a Contract with<br>pecified in the bidding or<br>ract and for the prompt<br>of the Principal to enter<br>rence not to exceed the<br>bligee may in good faith<br>null and void, otherwise |
| Signed and sealed this day of March                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <u> </u>                                                                                                                                                                                           |
| Sierra Nevada Construction, Ind<br>(Principal)<br>(Witness)<br>By:<br>Marc J. Markevell, Secretary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (Seal)<br>Treasurer (Title)                                                                                                                                                                        |
| Cassendra Medica:<br>(Witness)<br>(Witness)<br>Liberty Mutual Insurance Comp<br>(Surety)<br>By: OT XOUS<br>Attorney-in-Fact Lori) Jones, Attorney<br>Surety Phone No. 775-996-6037                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | any (Seal)<br>y-In-Fact (Title)                                                                                                                                                                    |

AIA DOCUMENT A310 • BID BOND • AIA • FEBRUARY 1970 ED. • THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., N.W., WASHINGTON, D.C. 20006

| COUNTY OF Washoe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| a 3-30-18 Later Cassandra Me                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | dina                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| pomonally approach Lori Jones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| personally known to me (or proved to me on the basis of<br>subscribed to the within instrument and acknowledged to<br>capacity(les), and that by his/her/their signature(s) on the<br>person(s) acted, executed the instrument.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | satisfactory evidence) to be the person(s) whose name(s) is/a<br>me that he/she/they executed the same in his/her/their authoriz<br>instrument the person(s), or the entity upon behalf of which t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| WITNESS my hand and official seal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Signature Carpenarra Medence (SE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | AL)<br>CASSANDRA MEDINA<br>Notary Public - State of Nevada<br>Appointment Recorded in Washoe County<br>No: 17-4072-2 - Expires November 20, 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 22<br>22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| Though the data below is not required by law, it may p<br>prevent fraudulent reattachment of this form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | rove valuable to persons relying on the document and cou                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Though the data below is not required by law, it may porevent fraudulent reattachment of this form.    CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER INDIVIDUAL CORPORATE OFFICER INDIVIDUAL GENERAL ATTORNEY-IN-FACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TIONAL<br>rove valuable to persons relying on the document and cou<br>DESCRIPTION OF ATTACHED DOCUMENT<br>TITLE OF TYPE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Though the data below is not required by law, it may porevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER TITLE(S)  PARTNER(S)  CAPACITY CLAIMED BY SIGNER  ATTORNEY-IN-FACT TRUSTEE(S)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TIONAL To persons relying on the document and cou DESCRIPTION OF ATTACHED DOCUMENT TITLE OF TYPE OF DOCUMENT NUMBER OF PAGES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| OP  Though the data below is not required by law, it may p prevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER TITLE(S) PARTNER(S) GUARDIAN/CONSERVATOR OTHER:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TIONAL TOVE valuable to persons relying on the document and cou DESCRIPTION OF ATTACHED DOCUMENT TITLE OF TYPE OF DOCUMENT NUMBER OF PAGES DATE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| OP  Though the data below is not required by law, it may p prevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER ITTLE(S) PARTNER(S) CAPACTOR GUARDIAN/CONSERVATOR OTHER: GUARDIAN/CONSERVATOR GUARDIAN/CONSERVATO           | TIONAL rove valuable to persons relying on the document and cou DESCRIPTION OF ATTACHED DOCUMENT TITLE OF TYPE OF DOCUMENT NUMBER OF PAGES DATE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| OP  Though the data below is not required by law, it may p prevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER TITLE(S) PARTNER(S) GUARDIAN/CONSERVATOR OTHER:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TIONAL Tove valuable to persons relying on the document and count of the document and count of the document of |
| OP <sup>-</sup> Though the data below is not required by law, it may p prevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER INTLE(S) PARTNER(S) CORPORATE OFFICER GENERAL ATTORNEY-IN-FACT GENERAL G | TIONAL rove valuable to persons relying on the document and cou DESCRIPTION OF ATTACHED DOCUMENT TITLE OF TYPE OF DOCUMENT NUMBER OF PAGES DATE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| OP <sup>-</sup> Though the data below is not required by law, it may p prevent fraudulent reattachment of this form.  CAPACITY CLAIMED BY SIGNER  INDIVIDUAL CORPORATE OFFICER ITTLE(S) PARTNER(S) CAPACTATIONEY-IN-FACT GENERAL ATTORNEY-IN-FACT GUARDIAN/CONSERVATOR GUARDIA | TIONAL rove valuable to persons relying on the document and cou DESCRIPTION OF ATTACHED DOCUMENT TITLE OF TYPE OF DOCUMENT NUMBER OF PAGES DATE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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ALL-PURPOSE ACKNOWLEDGEMENT

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND. This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Certificate No. 7803358 Liberty Mutual Insurance Company The Ohio Casualty Insurance Company West American Insurance Company POWER OF ATTORNEY KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Andrea M. Cantlon; Lori Jones; Nicholas D. Rossi; Patricia Owens; Teri L. Wood all of the city of Reno , state of NV each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons. IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 14th 2017 day of June 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day The Ohio Casualty Insurance Company Liberty Mutual Insurance Company 1010 1912 1991 West American Insurance Company rate, interest rate or residual value guarantees. By: David M. Carey, Assistant Secretary STATE OF PENNSYLVANIA SS COUNTY OF MONTGOMERY Can On this 14th day of June , 2017, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes Power of Attorney therein contained by signing on behalf of the corporations by himself as a duly authorized officer. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written. PAS COMMONWEALTH OF PENNSYLVANIA Notarial Seat Teresa Pastella, Notary Public ÖF eresa Pastella, Notary Public Upper Merion Twp., Montgomery County My Commission Expires March 28, 2021 Member, Pennsylvania Association of Notaries ARY PU This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Ś Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows: 5 ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, validity acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority. currency ARTICLE XIII - Execution of Contracts - SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, confirm and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary. 0 Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M, Carey, Assistant Secretary to appoint such attorneys-infact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed. I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked. IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 3D day of 1912 1991 Renee C. Lleweiryn, Assistant Secretan

Not valid for mortgage, note, loan, letter of credi

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#### Fresno County Department of Public Works and Planning

| Proje<br>Cont              | ct: Bitumino<br>act No.: 17-3                                                                                            | us Seal C<br>25-C                                              | oats  | 17/18                                                |                               |                             |                                                         | Bid Opening:<br>Scheduled Award Date: | 4/10/2018<br>5/8/2018                                 |                             |                                                      |                             |                                            |                             |                                                                             |                             |                                                                             |                             |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------|------------------------------------------------------|-------------------------------|-----------------------------|---------------------------------------------------------|---------------------------------------|-------------------------------------------------------|-----------------------------|------------------------------------------------------|-----------------------------|--------------------------------------------|-----------------------------|-----------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------|-----------------------------|
| 1<br>2<br>3<br>4<br>5<br>6 | Bidders<br>Sierra Nevada Co<br>Intermountain Slu<br>Northwest Paving<br>Telfer<br>VSS International,<br>Graham Contracto | nstruction, In<br>rry Seal, Inc.<br>, Inc<br>Inc.<br>ars, Inc. | e.    |                                                      |                               |                             | Sierra Nevada Const<br>Subcontractors<br>Chrisp Company | ruction, Inc.                         | Intermountain Slu<br>Subcontractors<br>Chrisp Company | rry Seal, Inc.              | Northwest Paving<br>Subcontractors<br>Chrisp Company | , Inc                       | Telfer<br>Subcontractors<br>Chrisp Company |                             | VSS International,<br>Subcontractors<br>Chrisp Company<br>KRC Safety Co., I | nc                          | Graham Contractors<br>Subcontractors<br>Chrisp Company<br>KRC Safety Co., I | ns, Inc.                    |
| BASE                       | BID (LOCATIO                                                                                                             | NS 1 THRO                                                      | UGH 1 | 10)                                                  | Engine                        | er's Estimate               |                                                         | 1                                     |                                                       | 2                           |                                                      | 3                           |                                            | 4                           |                                                                             | 5                           |                                                                             | 6                           |
| ITEM<br>NO.                | ESTIMATED<br>QUANTITY                                                                                                    | UNIT OF<br>MEASURE                                             | F, S  | ITEM DESCRIPTION                                     | ITEM PRICE<br>(IN<br>FIGURES) | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES)                              | TOTAL PRICE (IN<br>FIGURES)           | ITEM PRICE<br>(IN FIGURES)                            | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES)                           | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES)                 | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES)                                                  | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES)                                                  | TOTAL PRICE<br>(IN FIGURES) |
| 1                          | 1                                                                                                                        | LS                                                             |       | SUPPLEMENTAL WORK                                    | 20,700.00                     | \$20,700.00                 | 20,700.00                                               | \$20,700.00                           | \$20,700.00                                           | \$20,700.00                 | \$20,700.00                                          | \$20,700.00                 | \$20,700.00                                | \$20,700.00                 | \$20,700.00                                                                 | \$20,700.00                 | \$20,700.00                                                                 | \$20,700.00                 |
| 2                          | 1                                                                                                                        | LS                                                             | S     | TRAFFIC CONTROL SYSTEM                               | 58,846.00                     | \$58,846.00                 | 375,306.60                                              | \$375,306.60                          | \$108,216.00                                          | \$108,216.00                | \$119,100.10                                         | \$119,100.10                | \$371,500.00                               | \$371,500.00                | \$190,187.75                                                                | \$190,187.75                | \$250,000.00                                                                | \$250,000.00                |
| 3                          | 1                                                                                                                        | LS                                                             |       | TEMPORARY PAVEMENT MARKING                           | 8,826.90                      | \$8,826.90                  | 2,000.00                                                | \$2,000.00                            | \$1,000.00                                            | \$1,000.00                  | \$9,000.00                                           | \$9,000.00                  | \$10,000.00                                | \$10,000.00                 | \$25,000.00                                                                 | \$25,000.00                 | \$7,500.00                                                                  | \$7,500.00                  |
| 4                          | 1                                                                                                                        | LS                                                             |       | JOB SITE MANAGEMENT                                  | 800.00                        | \$800.00                    | 1,000.00                                                | \$1,000.00                            | \$2,500.00                                            | \$2,500.00                  | \$7,500.00                                           | \$7,500.00                  | \$5,000.00                                 | \$5,000.00                  | \$1,000.00                                                                  | \$1,000.00                  | \$10,000.00                                                                 | \$10,000.00                 |
| 5                          | 1                                                                                                                        | LS                                                             |       | PREPARE WATER POLLUTION CONTROL PROGRAM              | 1,750.00                      | \$1,750.00                  | 1,200.00                                                | \$1,200.00                            | \$1,000.00                                            | \$1,000.00                  | \$1,500.00                                           | \$1,500.00                  | \$500.00                                   | \$500.00                    | \$1,000.00                                                                  | \$1,000.00                  | \$1,000.00                                                                  | \$1,000.00                  |
| 6                          | 1,298                                                                                                                    | TON                                                            |       | SAND COVER (SEAL)                                    | 50.00                         | \$64,900.00                 | 12.00                                                   | \$15,576.00                           | \$20.00                                               | \$25,960.00                 | \$45.00                                              | \$58,410.00                 | \$17.00                                    | \$22,066.00                 | \$33.00                                                                     | \$42,834.00                 | \$41.00                                                                     | \$53,218.00                 |
| 7                          | 581                                                                                                                      | TON                                                            |       | POLYMER ASPHALTIC EMULSION (SEAL COAT)               | 500.00                        | \$290,500.00                | 250.00                                                  | \$145,250.00                          | \$1,150.00                                            | \$668,150.00                | \$600.00                                             | \$348,600.00                | \$475.00                                   | \$275,975.00                | \$444.00                                                                    | \$257,964.00                | \$495.00                                                                    | \$287,595.00                |
| 8                          | 5,395                                                                                                                    | TON                                                            |       | SCREENINGS (3/8')                                    | 40.00                         | \$215,800.00                | 45.00                                                   | \$242,775.00                          | \$35.00                                               | \$188,825.00                | \$50.00                                              | \$269,750.00                | \$40.00                                    | \$215,800.00                | \$88.00                                                                     | \$474,760.00                | \$51.00                                                                     | \$275,145.00                |
| 9                          | 113                                                                                                                      | TON                                                            |       | ASPHALTIC EMULSION (FLUSH COAT)                      | 400.00                        | \$45,200.00                 | 400.00                                                  | \$45,200.00                           | \$450.00                                              | \$50,850.00                 | \$550.00                                             | \$62,150.00                 | \$500.00                                   | \$56,500.00                 | \$333.00                                                                    | \$37,629.00                 | \$413.00                                                                    | \$46,669.00                 |
| 10                         | 18                                                                                                                       | EA                                                             | s     | PAVEMENT MARKER (TYPE D)                             | 5.00                          | \$90.00                     | 5.00                                                    | \$90.00                               | \$5.00                                                | \$90.00                     | \$5.00                                               | \$90.00                     | \$5.00                                     | \$90.00                     | \$5.25                                                                      | \$94.50                     | \$5.00                                                                      | \$90.00                     |
| 11                         | 4,000                                                                                                                    | LF                                                             | S     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 27B) | 0.60                          | \$2,400.00                  | 0.70                                                    | \$2,800.00                            | \$0.70                                                | \$2,800.00                  | \$0.70                                               | \$2,800.00                  | \$0.70                                     | \$2,800.00                  | \$0.74                                                                      | \$2,960.00                  | \$0.70                                                                      | \$2,800.00                  |
| 12                         | 131,757                                                                                                                  | LF                                                             | s     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 5)   | 0.30                          | \$39,527.10                 | 0.43                                                    | \$56,655.51                           | \$0.43                                                | \$56,655.51                 | \$0.50                                               | \$65,878.50                 | \$0.43                                     | \$56,655.51                 | \$0.45                                                                      | \$59,290.65                 | \$0.43                                                                      | \$56,655.51                 |
| 13                         | 23,200                                                                                                                   | LF                                                             | S     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 18)  | 0.60                          | \$13,920.00                 | 1.00                                                    | \$23,200.00                           | \$1.00                                                | \$23,200.00                 | \$1.00                                               | \$23,200.00                 | \$1.00                                     | \$23,200.00                 | \$1.05                                                                      | \$24,360.00                 | \$1.00                                                                      | \$23,200.00                 |
| 14                         | 200                                                                                                                      | SF                                                             | S     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 28)  | 0.75                          | \$150.00                    | 3.00                                                    | \$600.00                              | \$3.00                                                | \$600.00                    | \$3.00                                               | \$600.00                    | \$3.00                                     | \$600.00                    | \$3.15                                                                      | \$630.00                    | \$3.00                                                                      | \$600.00                    |
| 15                         | 200                                                                                                                      | SF                                                             | S     | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29)  | 0.75                          | \$150.00                    | 3.00                                                    | \$600.00                              | \$3.00                                                | \$600.00                    | \$3.00                                               | \$600.00                    | \$3.00                                     | \$600.00                    | \$3.15                                                                      | \$630.00                    | \$3.00                                                                      | \$600.00                    |
| 16                         | 22                                                                                                                       | SF                                                             | s     | THERMOPLASTIC PAVEMENT MARKING (STOP)                | 5.00                          | \$110.00                    | 8.00                                                    | \$176.00                              | \$8.00                                                | \$176.00                    | \$8.00                                               | \$176.00                    | \$8.00                                     | \$176.00                    | \$8.40                                                                      | \$184.80                    | \$8.00                                                                      | \$176.00                    |
| 17                         | 954                                                                                                                      | SF                                                             | S     | THERMOPLASTIC PAVEMENT MARKING (STOP AHEAD)          | 5.00                          | \$4,770.00                  | 8.00                                                    | \$7,632.00                            | \$8.00                                                | \$7,632.00                  | \$8.00                                               | \$7,632.00                  | \$8.00                                     | \$7,632.00                  | \$8.40                                                                      | \$8,013.60                  | \$8.00                                                                      | \$7,632.00                  |
| 18                         | 253                                                                                                                      | SF                                                             | S     | THERMOPLASTIC PAVEMENT MARKING (STOP BAR)            | 5.00                          | \$1,265.00                  | 8.00                                                    | \$2,024.00                            | \$8.00                                                | \$2,024.00                  | \$8.00                                               | \$2,024.00                  | \$8.00                                     | \$2,024.00                  | \$8.40                                                                      | \$2,125.20                  | \$8.00                                                                      | \$2,024.00                  |
| 19                         | 55                                                                                                                       | SF                                                             | S     | THERMOPLASTIC PAVEMENT MARKING (YIELD AHEAD)         | 5.00                          | \$275.00                    | 8.00                                                    | \$440.00                              | \$8.00                                                | \$440.00                    | \$8.00                                               | \$440.00                    | \$8.00                                     | \$440.00                    | \$8.40                                                                      | \$462.00                    | \$8.00                                                                      | \$440.00                    |
| 20                         | 236                                                                                                                      | SF                                                             | S     | REMOVE THERMOPLASTIC PAVEMENT MARKING                | 4.00                          | \$944.00                    | 5.00                                                    | \$1,180.00                            | \$5.00                                                | \$1,180.00                  | \$5.00                                               | \$1,180.00                  | \$5.00                                     | \$1,180.00                  | \$5.25                                                                      | \$1,239.00                  | \$5.00                                                                      | \$1,180.00                  |
| 21                         | 40,738                                                                                                                   | LF                                                             | S     | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 5)       | 0.50                          | \$20,369.00                 | 0.28                                                    | \$11,406.64                           | \$0.28                                                | \$11,406.64                 | \$0.30                                               | \$12,221.40                 | \$0.28                                     | \$11,406.64                 | \$0.29                                                                      | \$11,814.02                 | \$0.28                                                                      | \$11,406.64                 |
| 22                         | 6,400                                                                                                                    | LF                                                             | S     | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 18)      | 0.60                          | \$3,840.00                  | 0.40                                                    | \$2,560.00                            | \$0.40                                                | \$2,560.00                  | \$0.40                                               | \$2,560.00                  | \$0.40                                     | \$2,560.00                  | \$0.42                                                                      | \$2,688.00                  | \$0.40                                                                      | \$2,560.00                  |
| 23                         | 200                                                                                                                      | LF                                                             | S     | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 28)      | 0.60                          | \$120.00                    | 0.40                                                    | \$80.00                               | \$0.40                                                | \$80.00                     | \$0.40                                               | \$80.00                     | \$0.40                                     | \$80.00                     | \$0.42                                                                      | \$84.00                     | \$0.40                                                                      | \$80.00                     |
| 24                         | 200                                                                                                                      | LF                                                             | S     | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)      | 0.60                          | \$120.00                    | 0.40                                                    | \$80.00                               | \$0.40                                                | \$80.00                     | \$0.40                                               | \$80.00                     | \$0.40                                     | \$80.00                     | \$0.42                                                                      | \$84.00                     | \$0.40                                                                      | \$80.00                     |
| 25                         | 1                                                                                                                        | LS                                                             |       | MOBILIZATION                                         | 8,000.00                      | \$8,000.00                  | 150,000.00                                              | \$150,000.00                          | \$30,000.00                                           | \$30,000.00                 | \$131,136.00                                         | \$131,136.00                | \$100,000.00                               | \$100,000.00                | \$115,000.00                                                                | \$115,000.00                | \$365,000.00                                                                | \$365,000.00                |
|                            | TOTAL BID (I                                                                                                             | TEMS 1-2                                                       | 5)    |                                                      | \$80                          | 3,373.00                    | \$1,                                                    | 108,531.75                            | \$1,20                                                | 6,725.15                    | \$1,14                                               | 7,408.00                    | \$1,18                                     | 7,565.15                    | \$1,28                                                                      | 0,734.52                    | \$1,42                                                                      | 5,351.15                    |
| E -                        | Linal Pay Hem                                                                                                            |                                                                |       |                                                      |                               |                             |                                                         |                                       |                                                       |                             |                                                      |                             |                                            |                             |                                                                             |                             |                                                                             |                             |

F - Final Pay Item S - Specialty Item

| ADDI        | TIVE 1A                          | From AUB           | ERRY | MILLERTON (WEST) To GREEN MEADOW (PRIVATE)          | Engine                        | eer's Estimate              |                            | 1                           |                            | 2                           |                            | 3                           |                            | 4                           |                            | 5                           |                            | 6                           |
|-------------|----------------------------------|--------------------|------|-----------------------------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|
| ITEM<br>NO. | ESTMATED<br>QUANTITY             | UNIT OF<br>MEASURE | F, S | ITEM DESCRIPTION                                    | ITEM PRICE<br>(IN<br>FIGURES) | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE (IN<br>FIGURES) | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
| 26          | 1                                | LS                 |      | SUPPLEMENTAL WORK                                   | 2,800.00                      | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  | \$2,800.00                 | \$2,800.00                  |
| 27          | 1                                | LS                 | s    | TRAFFIC CONTROL SYSTEM                              | 7,980.00                      | \$7,980.00                  | \$35,000.00                | \$35,000.00                 | \$7,000.00                 | \$7,000.00                  | \$19,253.00                | \$19,253.00                 | \$58,000.00                | \$58,000.00                 | \$24,034.75                | \$24,034.75                 | \$30,000.00                | \$30,000.00                 |
| 28          | 1                                | LS                 |      | TEMPORARY PAVEMENT MARKING                          | 1,197.00                      | \$1,197.00                  | \$1,000.00                 | \$1,000.00                  | \$100.00                   | \$100.00                    | \$1,500.00                 | \$1,500.00                  | \$1,000.00                 | \$1,000.00                  | \$1,000.00                 | \$1,000.00                  | \$1,000.00                 | \$1,000.00                  |
| 29          | 1                                | LS                 |      | JOB SITE MANAGEMENT                                 | 80.00                         | \$80.00                     | \$500.00                   | \$500.00                    | \$100.00                   | \$100.00                    | \$2,500.00                 | \$2,500.00                  | \$1,500.00                 | \$1,500.00                  | \$500.00                   | \$500.00                    | \$3,200.00                 | \$3,200.00                  |
| 30          | 1                                | LS                 |      | PREPARE WATER POLLUTION CONTROL PROGRAM             | 175.00                        | \$175.00                    | \$250.00                   | \$250.00                    | \$100.00                   | \$100.00                    | \$500.00                   | \$500.00                    | \$500.00                   | \$500.00                    | \$500.00                   | \$500.00                    | \$750.00                   | \$750.00                    |
| 31          | 177                              | TON                |      | SAND COVER (SEAL)                                   | 50.00                         | \$8,850.00                  | \$12.00                    | \$2,124.00                  | \$20.00                    | \$3,540.00                  | \$50.00                    | \$8,850.00                  | \$17.00                    | \$3,009.00                  | \$33.00                    | \$5,841.00                  | \$50.00                    | \$8,850.00                  |
| 32          | 79                               | TON                |      | POLYMER ASPHALTIC EMULSION (SEAL COAT)              | 500.00                        | \$39,500.00                 | \$250.00                   | \$19,750.00                 | \$825.00                   | \$65,175.00                 | \$600.00                   | \$47,400.00                 | \$475.00                   | \$37,525.00                 | \$444.00                   | \$35,076.00                 | \$495.00                   | \$39,105.00                 |
| 33          | 738                              | TON                |      | SCREENINGS (3/8*)                                   | 40.00                         | \$29,520.00                 | \$45.00                    | \$33,210.00                 | \$35.00                    | \$25,830.00                 | \$50.00                    | \$36,900.00                 | \$40.00                    | \$29,520.00                 | \$88.00                    | \$64,944.00                 | \$60.00                    | \$44,280.00                 |
| 34          | 15                               | TON                |      | ASPHALTIC EMULSION (FLUSH COAT)                     | 400.00                        | \$6,000.00                  | \$400.00                   | \$6,000.00                  | \$450.00                   | \$6,750.00                  | \$500.00                   | \$7,500.00                  | \$500.00                   | \$7,500.00                  | \$333.00                   | \$4,995.00                  | \$413.00                   | \$6,195.00                  |
| 35          | 1,740                            | EA                 | s    | PAVEMENT MARKER (TYPE D)                            | 5.00                          | \$8,700.00                  | \$4.50                     | \$7,830.00                  | \$4.50                     | \$7,830.00                  | \$5.00                     | \$8,700.00                  | \$4.50                     | \$7,830.00                  | \$4.73                     | \$8,230.20                  | \$4.50                     | \$7,830.00                  |
| 36          | 370                              | EA                 | s    | PAVEMENT MARKER (TYPE H)                            | 5.00                          | \$1,850.00                  | \$4.50                     | \$1,665.00                  | \$4.50                     | \$1,665.00                  | \$5.00                     | \$1,850.00                  | \$4.50                     | \$1,665.00                  | \$4.73                     | \$1,750.10                  | \$4.50                     | \$1,665.00                  |
| 37          | 42,134                           | LF                 | s    | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           | 0.25                          | \$10,533.50                 | \$0.25                     | \$10,533.50                 | \$0.25                     | \$10,533.50                 | \$0.25                     | \$10,533.50                 | \$0.25                     | \$10,533.50                 | \$0.26                     | \$10,954.84                 | \$0.25                     | \$10,533.50                 |
| 38          | 1,214                            | LF                 | s    | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 19) | 0.30                          | \$364.20                    | \$1.00                     | \$1,214.00                  | \$1.00                     | \$1,214.00                  | \$1.00                     | \$1,214.00                  | \$1.00                     | \$1,214.00                  | \$1.05                     | \$1,274.70                  | \$1.00                     | \$1,214.00                  |
| 39          | 19,626                           | LF                 | s    | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) | 0.60                          | \$11,775.60                 | \$1.45                     | \$28,457.70                 | \$1.45                     | \$28,457.70                 | \$1.50                     | \$29,439.00                 | \$1.45                     | \$28,457.70                 | \$1.52                     | \$29,831.52                 | \$1.45                     | \$28,457.70                 |
| 40          | 227                              | LF                 | s    | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 29) | 0.75                          | \$170.25                    | \$3.00                     | \$681.00                    | \$3.00                     | \$681.00                    | \$3.00                     | \$681.00                    | \$3.00                     | \$681.00                    | \$3.15                     | \$715.05                    | \$3.00                     | \$681.00                    |
| 41          | 227                              | LF                 | s    | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 19)     | 0.50                          | \$113.50                    | \$0.40                     | \$90.80                     | \$0.40                     | \$90.80                     | \$0.50                     | \$113.50                    | \$0.40                     | \$90.80                     | \$0.42                     | \$95.34                     | \$0.40                     | \$90.80                     |
| 42          | 1214                             | LF                 | s    | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     | 0.60                          | \$728.40                    | \$0.40                     | \$485.60                    | \$0.40                     | \$485.60                    | \$0.50                     | \$607.00                    | \$0.40                     | \$485.60                    | \$0.42                     | \$509.88                    | \$0.40                     | \$485.60                    |
| 43          | 19626                            | LF                 | s    | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 29)     | 0.60                          | \$11,775.60                 | \$0.40                     | \$7,850.40                  | \$0.40                     | \$7,850.40                  | \$0.50                     | \$9,813.00                  | \$0.40                     | \$7,850.40                  | \$0.42                     | \$8,242.92                  | \$0.40                     | \$7,850.40                  |
| 44          | 1                                | LS                 |      | MOBILIZATION                                        | 800.00                        | \$800.00                    | \$12,000.00                | \$12,000.00                 | \$100.00                   | \$100.00                    | \$19,500.00                | \$19,500.00                 | \$5,000.00                 | \$5,000.00                  | \$35,000.00                | \$35,000.00                 | \$33,500.00                | \$33,500.00                 |
|             | TOTAL ADDI                       | TIVE 1A (I         | TEM  | S 26 THROUGH 44)                                    | \$14                          | 42,913.05                   | \$1                        | 71,442.00                   | \$17                       | 0,303.00                    | \$205                      | 9,654.00                    | \$205                      | ,162.00                     | \$236                      | ,295.30                     | \$228                      | ,488.00                     |
| F-<br>S-    | Final Pay Item<br>Specialty Item |                    |      |                                                     |                               |                             |                            |                             |                            |                             |                            |                             |                            |                             |                            |                             |                            |                             |
| ADDI        | TIVE 2A                          | From AUB           | ERRY | GREEN MEADOW (PRIVATE) To QUAIL HOLLOW (PRIVATE)    | Engine                        | eer's Estimate              |                            | 1                           |                            | 2                           |                            | 3                           |                            | 4                           |                            | 5                           |                            | 6                           |
| ITEM<br>NO. | ESTMATED<br>QUANTITY             | UNIT OF<br>MEASURE | F, S | ITEM DESCRIPTION                                    | ITEM PRICE<br>(IN<br>FIGURES) | TOTAL PRICE<br>(IN FIGURES) | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE (IN<br>FIGURES) | ITEM PRICE<br>(IN FIGURES) | TOTAL PRICE<br>(IN FIGURES) |
| 45          | 1                                | LS                 |      | SUPPLEMENTAL WORK                                   | 3,200.00                      | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  | \$3,200.00                 | \$3,200.00                  |
| 46          | 1                                | LS                 | s    | TRAFFIC CONTROL SYSTEM                              | 9,036.00                      | \$9,036.00                  | \$40,000.00                | \$40,000.00                 | \$8,000.00                 | \$8,000.00                  | \$21,500.00                | \$21,500.00                 | \$70,000.00                | \$70,000.00                 | \$27,788.50                | \$27,788.50                 | \$35,000.00                | \$35,000.00                 |
| 47          | 1                                | 15                 |      | TEMPORARY PAVEMENT MARKING                          | 1 355 40                      | \$1.355.40                  | \$1,000,00                 | \$1,000,00                  | \$100.00                   | \$100.00                    | \$1 500 00                 | \$1 500 00                  | \$500.00                   | \$500.00                    | \$1,000,00                 | \$1,000,00                  | \$1 250 00                 | \$1 250 00                  |

| 45       | 1                                | LS         |     | SUPPLEMENTAL WORK                                   | 3,200.00 | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00 | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  | \$3,200.00  |
|----------|----------------------------------|------------|-----|-----------------------------------------------------|----------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 46       | 1                                | LS         | s   | TRAFFIC CONTROL SYSTEM                              | 9,036.00 | \$9,036.00  | \$40,000.00 | \$40,000.00 | \$8,000.00 | \$8,000.00  | \$21,500.00 | \$21,500.00 | \$70,000.00 | \$70,000.00 | \$27,788.50 | \$27,788.50 | \$35,000.00 | \$35,000.00 |
| 47       | 1                                | LS         |     | TEMPORARY PAVEMENT MARKING                          | 1,355.40 | \$1,355.40  | \$1,000.00  | \$1,000.00  | \$100.00   | \$100.00    | \$1,500.00  | \$1,500.00  | \$500.00    | \$500.00    | \$1,000.00  | \$1,000.00  | \$1,250.00  | \$1,250.00  |
| 48       | 1                                | LS         |     | JOB SITE MANAGEMENT                                 | 80.00    | \$80.00     | \$500.00    | \$500.00    | \$100.00   | \$100.00    | \$2,500.00  | \$2,500.00  | \$1,500.00  | \$1,500.00  | \$500.00    | \$500.00    | \$3,750.00  | \$3,750.00  |
| 49       | 1                                | LS         |     | PREPARE WATER POLLUTION CONTROL PROGRAM             | 175.00   | \$175.00    | \$250.00    | \$250.00    | \$100.00   | \$100.00    | \$500.00    | \$500.00    | \$500.00    | \$500.00    | \$500.00    | \$500.00    | \$750.00    | \$750.00    |
| 50       | 201                              | TON        |     | SAND COVER (SEAL)                                   | 50.00    | \$10,050.00 | \$12.00     | \$2,412.00  | \$20.00    | \$4,020.00  | \$55.00     | \$11,055.00 | \$17.00     | \$3,417.00  | \$33.00     | \$6,633.00  | \$50.00     | \$10,050.00 |
| 51       | 90                               | TON        |     | POLYMER ASPHALTIC EMULSION (SEAL COAT)              | 500.00   | \$45,000.00 | \$250.00    | \$22,500.00 | \$825.00   | \$74,250.00 | \$650.00    | \$58,500.00 | \$475.00    | \$42,750.00 | \$444.00    | \$39,960.00 | \$495.00    | \$44,550.00 |
| 52       | 835                              | TON        |     | SCREENINGS (MEDIUM)                                 | 40.00    | \$33,400.00 | \$45.00     | \$37,575.00 | \$35.00    | \$29,225.00 | \$50.00     | \$41,750.00 | \$40.00     | \$33,400.00 | \$88.00     | \$73,480.00 | \$60.00     | \$50,100.00 |
| 53       | 17                               | TON        |     | ASPHALTIC EMULSION (FLUSH COAT)                     | 400.00   | \$6,800.00  | \$400.00    | \$6,800.00  | \$450.00   | \$7,650.00  | \$550.00    | \$9,350.00  | \$500.00    | \$8,500.00  | \$333.00    | \$5,661.00  | \$413.00    | \$7,021.00  |
| 54       | 2,386                            | EA         | s   | PAVEMENT MARKER (TYPE D)                            | 5.00     | \$11,930.00 | \$4.50      | \$10,737.00 | \$4.50     | \$10,737.00 | \$5.00      | \$11,930.00 | \$4.50      | \$10,737.00 | \$4.73      | \$11,285.78 | \$4.50      | \$10,737.00 |
| 55       | 47,710                           | LF         | s   | PAINT TRAFFIC STRIPE (2-COAT) (DETAIL 39)           | 0.25     | \$11,927.50 | \$0.25      | \$11,927.50 | \$0.25     | \$11,927.50 | \$0.25      | \$11,927.50 | \$0.25      | \$11,927.50 | \$0.26      | \$12,404.60 | \$0.25      | \$11,927.50 |
| 56       | 23,855                           | LF         | s   | THERMOPLASTIC TRAFFIC STRIPE (EXTRUDED) (DETAIL 22) | 0.60     | \$14,313.00 | \$1.45      | \$34,589.75 | \$1.45     | \$34,589.75 | \$1.50      | \$35,782.50 | \$1.45      | \$34,589.75 | \$1.52      | \$36,259.60 | \$1.45      | \$34,589.75 |
| 57       | 23,855                           | LF         | s   | REMOVE THERMOPLASTIC TRAFFIC STRIPE (DETAIL 22)     | 0.50     | \$11,927.50 | \$0.40      | \$9,542.00  | \$0.40     | \$9,542.00  | \$0.50      | \$11,927.50 | \$0.40      | \$9,542.00  | \$0.42      | \$10,019.10 | \$0.40      | \$9,542.00  |
| 58       | 1                                | LS         |     | MOBILIZATION                                        | 800.00   | \$800.00    | \$14,000.00 | \$14,000.00 | \$100.00   | \$100.00    | \$15,804.50 | \$15,804.50 | \$5,000.00  | \$5,000.00  | \$35,000.00 | \$35,000.00 | \$39,000.00 | \$39,000.00 |
|          | TOTAL ADDI                       | TIVE 2A (I | TEM | S 45 THROUGH 58)                                    | \$1      | 59,994.40   | \$1         | 95,033.25   | \$193      | 3,541.25    | \$237       | ,227.00     | \$23        | 5,563.25    | \$263       | ,691.58     | \$261       | ,467.25     |
| F.<br>S. | Final Pay Item<br>Specialty Item |            |     |                                                     |          |             |             |             |            |             |             |             |             |             |             |             |             |             |

TOTAL BASE BID + ADDITIVES 1A AND 2A (BID ITEMS 1 THROUGH 58) \$1,106,280.45 \$1,475,007.00 \$1,570,569.40 \$1,594,289.00 \$1,628,290.40 \$1,780,721.40 \$1,916,306.40



# County of Fresno

## DEPARTMENT OF PUBLIC WORKS AND PLANNING STEVEN E. WHITE, DIRECTOR

June 8, 2018

Kevin L. Robertson, President Sierra Nevada Construction, Inc. a Nevada Corporation 2055 E. Greg Street Sparks, NV 89435

### Subject: NOTICE OF APPROVAL, Bituminous Seal Coats at Various Locations in Fresno County; Contract No. 17-25-C

The contract between your firm and the County of Fresno for the referenced project became operative on June 7, 2018. Two copies of the executed contract are enclosed.

A "Notice to Proceed" authorizing commencement of the work will be issued by the Construction Engineer.

DIR Project ID 241025 is assigned to Contract No. 17-25-C.

The attached copy of Section 41 of the Charter of the County of Fresno is for your reference and compliance. If you have any questions contact Mitch Araki at <u>maraki@co.fresno.ca.us</u> or (559) 600-4501.

Sincerely,

Mohammad Alimi, Ph.D., P.E. Design Division Engineer

Alexis Rutherford, Interim Senior Staff Analyst

Enclosures

cc: Board of Supervisors, Auditor - Controller, Financial Services, Construction Management, Design Division – Design Services

| ACORD <sup>®</sup> CERTIFICATE OF L                                                                                                                                                                                                                            | IABIL                                         | ITY INS                                                | URANC                                                                                                           | Е [                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DAT                                                     | E (MM/DD/YYYY)                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------|
| THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION OF<br>CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AME<br>BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONST<br>REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDE                               | ONLY AND<br>IND, EXTE                         | CONFERS                                                | NO RIGHTS<br>TER THE CO<br>BETWEEN 1                                                                            | UPON THE CERTIFICA<br>OVERAGE AFFORDED<br>THE ISSUING INSURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ATE HO<br>BY TH<br>R(S), A                              | DLDER. THIS<br>IE POLICIES              |
| IMPORTANT: If the certificate holder is an ADDITIONAL INSURED,<br>the terms and conditions of the policy, certain policies may require a<br>certificate holder in lieu of such endorsement(s).                                                                 | the policy<br>an endorse                      | (ies) must b<br>ement. A sta                           | e endorsed.<br>Itement on th                                                                                    | If SUBROGATION IS Not in the subsection of the s | VAIVE                                                   | D, subject to<br>rights to the          |
| PRODUCER                                                                                                                                                                                                                                                       | CONTA                                         | CT Mary H                                              | earron                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (1))(gangengenangengengengengengengengengengengengengen |                                         |
| L/P Insurance Services. Inc.                                                                                                                                                                                                                                   | PHONE                                         | (775)                                                  | 996-6000                                                                                                        | FAX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | . (775)                                                 | 473-9280                                |
| 300 East 2nd Street                                                                                                                                                                                                                                            | E-MAIL                                        | mary.he                                                | earronelp                                                                                                       | ins.net                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Construction in the second                              |                                         |
| Suite 1300                                                                                                                                                                                                                                                     | AUDRE                                         | .33; <b>-</b>                                          |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PTT://godfsaincaineaaa                                  | NAIC #                                  |
| Reno NV 89501                                                                                                                                                                                                                                                  | INCLOS                                        | rea.The Ch                                             | arter Oal                                                                                                       | Fire Ing Co                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 000000000000000000000000000000000000000                 | 25615                                   |
| INSURED                                                                                                                                                                                                                                                        | INCLUDE                                       |                                                        | are Prop                                                                                                        | Cas Co of Americ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ••••••••••••••••••••••••••••••••••••••                  | 25674                                   |
| Sierra Nevada Construction, Inc.                                                                                                                                                                                                                               | INSURE                                        | R B. Argona                                            | ut Midwor                                                                                                       | t Ingurange Co                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                         | 19828                                   |
| P 0 Box 50760                                                                                                                                                                                                                                                  | INOUR                                         | RCALGOIN                                               | uc muwer                                                                                                        | of THEATANCE CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         | TJOLU                                   |
|                                                                                                                                                                                                                                                                | INSURE                                        |                                                        | ldah) (2n) enelopanyapapanya (1000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 00 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                         |
| Sparks NV 89435                                                                                                                                                                                                                                                | Meno                                          | BEI                                                    |                                                                                                                 | as devenden middas verde devende i neuros al para res error an annaer persona a da se al Para ( en 1945) a fais                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | entellante eta manatarra eta                            |                                         |
| COVERAGES CERTIFICATE NUMBER:CL17619                                                                                                                                                                                                                           | 969017                                        |                                                        | ******                                                                                                          | REVISION NUMBER:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | diça deserta a stati recerción                          |                                         |
| THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW<br>INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDIT<br>CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFO<br>EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY H | HAVE BEE<br>ION OF AN<br>ORDED BY<br>AVE BEEN | N ISSUED TO<br>Y CONTRACT<br>THE POLICIE<br>REDUCED BY | O THE INSURE<br>OR OTHER I<br>S DESCRIBED<br>PAID CLAIMS                                                        | ED NAMED ABOVE FOR<br>DOCUMENT WITH RESPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | THE PO<br>ECT TO<br>TO ALL                              | LICY PERIOD<br>WHICH THIS<br>THE TERMS, |
|                                                                                                                                                                                                                                                                | .0                                            | POLICY EFF                                             | POLICY EXP                                                                                                      | LIM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TS                                                      |                                         |
| X COMMERCIAL GENERAL LIABILITY Best Rating: A++                                                                                                                                                                                                                | XV                                            | [MM/DD/TTTT]                                           |                                                                                                                 | FACH OCCURRENCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | s                                                       | 1,000,000                               |
|                                                                                                                                                                                                                                                                |                                               |                                                        |                                                                                                                 | DAMAGE TO RENTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | s                                                       | 300,000                                 |
| Y \$50,000 PT/PD Deductible VTC20C05644B111COF                                                                                                                                                                                                                 | 17                                            | 7/1/2017                                               | 7/1/2018                                                                                                        | MED EXP (Any one person)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | \$                                                      | 5,000                                   |
|                                                                                                                                                                                                                                                                |                                               | .,                                                     |                                                                                                                 | PERSONAL & ADV IN ILLRY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | s                                                       | 1,000,000                               |
|                                                                                                                                                                                                                                                                |                                               |                                                        |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | \$                                                      | 2,000,000                               |
| DOLICY X PRO-                                                                                                                                                                                                                                                  |                                               |                                                        | ere en en                                                                                                       | PRODUCTS - COMPIOP AGG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | s                                                       | 2,000,000                               |
|                                                                                                                                                                                                                                                                |                                               |                                                        |                                                                                                                 | Electronic Data Liability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | s                                                       | 1.000.000                               |
| AUTOMOBILE LIABILITY Best Bating: Att                                                                                                                                                                                                                          | xv                                            |                                                        |                                                                                                                 | COMBINED SINGLE LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | \$                                                      | 1,000,000                               |
|                                                                                                                                                                                                                                                                | ~ ~                                           |                                                        |                                                                                                                 | (Ea accident)<br>BODILY INJURY (Per person)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                       |                                         |
| B ALL OWNED SCHEDULED                                                                                                                                                                                                                                          | 7                                             | 7/1/2017                                               | 7/1/2018                                                                                                        | BODILY INJURY (Per accident                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ) 5                                                     |                                         |
| AUTOS AUTOS NON-OWNED                                                                                                                                                                                                                                          |                                               | ,,1,2027                                               | 1, 1, 2010                                                                                                      | PROPERTY DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | \$                                                      |                                         |
| AUTOS                                                                                                                                                                                                                                                          |                                               |                                                        |                                                                                                                 | (Per accident)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | \$                                                      |                                         |
| Y UMBRELLA LIAR Y consum                                                                                                                                                                                                                                       | xv                                            |                                                        |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | e                                                       | 20,000,000                              |
|                                                                                                                                                                                                                                                                |                                               |                                                        |                                                                                                                 | ACODECATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | e                                                       | 20,000,000                              |
|                                                                                                                                                                                                                                                                | T.17                                          | 7/1/2017                                               | 7/1/2018                                                                                                        | Flectronic Data Liability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                         | 20,000,000                              |
| WORKERS COMPENSATION Best Bating: A XT                                                                                                                                                                                                                         | т                                             |                                                        |                                                                                                                 | X PER OTH-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                         |
| AND EMPLOYERS' LIABILITY                                                                                                                                                                                                                                       | -                                             |                                                        |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | e                                                       | 1 000 000                               |
| OFFICER/MEMBER EXCLUDED? Y N/A                                                                                                                                                                                                                                 |                                               | 1/1/2018                                               | 1/1/2019                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | E e                                                     | 1,000,000                               |
| If yes, describe under                                                                                                                                                                                                                                         |                                               | 1/1/2010                                               | 1/1/2015                                                                                                        | EL DISEASE - ER EMPLOTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                         | 1,000,000                               |
| DESCRIPTION OF OPERATIONS below                                                                                                                                                                                                                                |                                               |                                                        |                                                                                                                 | E.L. DISEASE - POLICY LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3                                                       | 1,000,000                               |
| B Installation Floater QT-630-4H597086-TI                                                                                                                                                                                                                      | L-17                                          | 07/01/2017                                             | 07/01/2018                                                                                                      | Any project, Iransit, storage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                         | 750,000                                 |
| \$1,000 Deductible                                                                                                                                                                                                                                             |                                               |                                                        |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                         |
| DESCRIPTION OF OPERATIONS ( LOCATIONS / VEHICLES (ACODD 104 Additional Benerics Pr                                                                                                                                                                             | hedule may h                                  | e attached if mo                                       | re snane is require                                                                                             | red)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                         |                                         |
| RE: 56665- Bituminous Seal Costs at Various Locati                                                                                                                                                                                                             | ons in 1                                      | Fresno Co                                              | unty - Co                                                                                                       | ntract No. 17-25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | i-C                                                     |                                         |
| When Named Insured's operations are performed for                                                                                                                                                                                                              | Certific                                      | cate Hold                                              | er pursua                                                                                                       | int to a valid wr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | itte                                                    | n contract                              |
| or agreement executed by Named Insured prior to lo                                                                                                                                                                                                             | ss. In                                        | accordan                                               | ce with t                                                                                                       | he policies list:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ed al                                                   | bove:                                   |
| Additional Insured Status is determined by attache                                                                                                                                                                                                             | d GL For                                      | cm #CGD24                                              | 6 08/05,                                                                                                        | Auto Form #CAT35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 53 02,                                                  | /15;                                    |
| Waiver of Subrogation Status is determined by GL F                                                                                                                                                                                                             | orm #CGI                                      | 0316 11/1                                              | 1, Auto F                                                                                                       | form #CAT353 02/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | .5, We                                                  | orkers                                  |
| Compensation Form #WC000313 4/84 & WC040306 4/84 ;                                                                                                                                                                                                             | Primary                                       | y and Non                                              | -Contribu                                                                                                       | itory Status is c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | leteri                                                  | mined by                                |
| GL Form #CGD246 U8/08 & Auto Form #CAT4/4 U2/16. E.                                                                                                                                                                                                            | xplosio                                       | n, collap                                              | se and un                                                                                                       | derground includ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | lea 1                                                   | i the                                   |
| CERTIFICATE HOLDER                                                                                                                                                                                                                                             | LANC                                          | ELLATION                                               |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                         |
|                                                                                                                                                                                                                                                                | SHO                                           | ULD ANY OF                                             | THE ABOVE D                                                                                                     | ESCRIBED POLICIES BE (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         | LED BEFORE                              |
| County of Fresno                                                                                                                                                                                                                                               | THE                                           | EXPIRATION                                             | DATE THE                                                                                                        | EREOF, NOTICE WILL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | BE DI                                                   | ELIVERED IN                             |
| 2220 Tulare Street                                                                                                                                                                                                                                             | ACC                                           | ORDANCE WI                                             | TH THE POLIC                                                                                                    | Y PROVISIONS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                         |                                         |
| 6th Floor                                                                                                                                                                                                                                                      |                                               |                                                        |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                         |
| Fresno, CA 93721                                                                                                                                                                                                                                               | AUTHO                                         | RIZED REPRESE                                          | NTATIVE                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                         |
|                                                                                                                                                                                                                                                                | 01                                            | DO MUNICIL (                                           | C1 L1 73 1-3 1-3 1-3 7                                                                                          | Stansano V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | nu                                                      | rah >                                   |
|                                                                                                                                                                                                                                                                | Isnawr                                        | ia murph/                                              | SHAWNA                                                                                                          | Creanna.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         | 7                                       |
|                                                                                                                                                                                                                                                                |                                               | © 19                                                   | 88-2014 AC                                                                                                      | ORD CORPORATION.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | All ric                                                 | ints reserved.                          |

ACORD 25 (2014/01) INS025 (201401) The ACORD name and logo are registered marks of ACORD

## COMMENTS/REMARKS

general liability policy. Cancellation endorsement IL T4 05 03 11 applies per attached.

OFREMARK

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#### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

## BLANKET ADDITIONAL INSURED (CONTRACTORS)

This endorsement modifies insurance provided under the following: COMMERCIAL GENERAL LIABILITY COVERAGE PART

- WHO IS AN INSURED (Section II) is amended to include any person or organization that you agree in a "written contract requiring insurance" to include as an additional insured on this Coverage Part, but:
  - a) Only with respect to liability for "bodily injury", "property damage" or "personal injury"; and
  - b) If, and only to the extent that, the injury or damage is caused by acts or omissions of you or your subcontractor in the performance of "your work" to which the "written contract requiring insurance" applies. The person or organization does not qualify as an additional insured with respect to the independent acts or omissions of such person or organization.
- 2. The insurance provided to the additional insured by this endorsement is limited as follows:
  - a) In the event that the Limits of Insurance of this Coverage Part shown in the Declarations exceed the limits of liability required by the "written contract requiring Insurance", the insurance provided to the additional insured shall be limited to the limits of liability required by that "written contract requiring insurance". This endorsement shall not Increase the limits of Insurance described in Section III – Limits Of Insurance.
  - b) The insurance provided to the additional in sured does not apply to "bodily injury", "property damage" or "personal injury" arising out of the rendering of, or failure to render, any professional architectural, engineering or survaying services, including:
    - The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders or change orders, or the preparing, approving, or failing to prepare or approve, drawings and specifications; and
    - Supervisory, Inspection, architectural or engineering activities.

- c) The insurance provided to the additional insured does not apply to "bodily injury" or "property demage" caused by "your work" and included in the "products-completed operations hazard" unless the "written contract requiring insurance" specifically requires you to provide such coverage for that additional insured, and then the insurance provided to the additional insured applies only to such "bodily injury" or "property damage" that occurs before the end of the period of time for which the "written contract requiring insurance" requires you to provide such coverage or the end of the policy period, whichever is earlier.
- 3. The insurance provided to the additional insured by this endorsement is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured for a loss we cover under this endorsement. However, if the "written contract requiring insurance" specifically requires that this insurance apply on a primary basis or a primary and non-contributory basis, this insurance is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured for such loss, and we will not share with that "other insurance". But the insurance provided to the additional insured by this endorsement still is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured when that person or organization is an additional insured under such "other insurance".
- As a condition of coverage provided to the additional insured by this endorsement:
  - a) The additional insured must give us written notice as soon as practicable of an "occurrence" or an offense which may result in a claim. To the extent possible, such notice should include:

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- How, when and where the "occurrence" or offense took place;
- The names and addresses of any injured persons and witnesses; and
- The nature and location of any injury or damage arising out of the "occurrence" or offense.
- b) If a claim is made or "suit" is brought against the additional insured, the additional insured must:
  - Immediately record the specifics of the claim or "sult" and the date received; and
  - II. Notify us as soon as practicable.

The additional insured must see to it that we receive written notice of the claim or "suit" as soon as practicable.

- c) The additional insured must immediately send us copies of all logal papers received in connection with the claim or "suit", cooperate with us in the Investigation or settlement of the claim or defense against the "suit", and otherwise comply with all policy conditions.
- d) The additional insured must tender the defense and indemnity of any claim or "suit" to

any provider of "other insurance" which would cover the additional insured for a loss we cover under this endorsement. However, this condition does not affect whether the insurance provided to the additional insured by this endorsement is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured as described in paragraph 3. above.

 The following definition is added to SECTION V. – DEFINITIONS:

> "Written contract requiring insurance" means that part of any written contract or agreement under which you are required to include a person or organization as an additional insured on this Coverage Part, provided that the "bodily injury" and "property damage" occurs and the "personal injury" is caused by an offense committed:

- After the signing and execution of the contract or agreement by you;
- b. While that part of the contract or agreement is in effect; and
- c. Before the end of the policy period.

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#### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## CONTRACTORS XTEND ENDORSEMENT

This endorsement modifies insurance provided under the following: COMMERCIAL GENERAL LIABILITY COVERAGE PART

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to this Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

- A. Aircraft Chartered With Pilot
- B. Damage To Premises Rented To You
- C. Increased Supplementary Payments
- D. Incidental Medical Malpractice
- E. Who Is An Insured Newly Acquired Or Formed Organizations
- F. Who is An Insured Broadened Named Insured – Unnamed Subsidiaries
- G. Blanket Additional Insured Owners, Managers Or Lessors Of Premises

#### PROVISIONS

A. AIRCRAFT CHARTERED WITH PILOT

The following is added to Exclusion g., Aircraft, Auto Or Watercraft, in Paragraph 2. of SECTION I – COVERAGES – COVERAGE A BODILY IN-JURY AND PROPERTY DAMAGE LIABILITY:

This exclusion does not apply to an aircraft that is:

- (a) Chartered with a pliot to any insured;
- (b) Not owned by any insured; and
- (c) Not being used to carry any person or property for a charge.
- B. DAMAGE TO PREMISES RENTED TO YOU
  - 1. The first paragraph of the exceptions in Exclusion J., Damage To Property, in Paragraph 2. of SECTION I - COVERAGES -COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY is deleted.
  - 2. The following replaces the last paragraph of Paragraph 2., Exclusions, of SECTION I – COVERAGES – COVERAGE A. BODILY

- H. Blanket Additional Insured Lessors Of Leased Equipment
- Blanket Additional Insured States Or Political Subdivisions – Permits
- J. Knowledge And Notice Of Occurrence Or Offense
- K. Unintentional Omission
- L. Blanket Walver Of Subrogation
- M. Amended Bodily Injury Definition
- N. Contractual Liability Railroads

#### INJURY AND PROPERTY DAMAGE LI-ABILITY:

Exclusions c. and g. through n. do not apply to "premises damage". Exclusion f.(1)(a) does not apply to "premises damage" caused by:

- a. Fire;
- b. Explosion;
- c. Lightning;
- d. Smoke resulting from such fire, explosion, or lightning; or
- e, Water;

unless Exclusion f. of Section I – Coverage A – Bodily Injury And Property Damage Liability is replaced by another endorsement to this Coverage Part that has Exclusion – All Pollution Injury Or Damage or Total Pollution Exclusion In its title.

A separate limit of insurance applies to "premises damage" as described in Paragraph 6, of SECTION III ~ LIMITS OF IN-SURANCE.

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 The following replaces Paragraph 6. of SEC-TION III – LIMITS OF INSURANCE:

Subject to 5, above, the Damage To Premlses Rented To You Limit is the most we will pay under Coverage A for damages because of "premises damage" to any one premises. The Damage To Premises Rented To You Limit will apply to all "property damage" proximately caused by the same "occurrence", whether such damage results from: fire; explosion; lightning; smoke resulting from such fire, explosion, or lightning; or water; or any combination of any of these causes.

The Damage To Premises Rented To You Limit will be:

- The amount shown for the Damage To Premises Rented To You Limit on the Declarations of this Coverage Part; or
- b. \$300,000 if no amount is shown for the Damage To Premises Rented To You Limit on the Declarations of this Coverage Part.
- The following replaces Paragraph a. of the definition of "insured contract" in the DEFINI-TIONS Section;
  - A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for "premises damage" is not an "insured contract";
- 5. The following is added to the **DEFINITIONS** Section:

"Premises damage" means "property damage" to:

- Any premises while rented to you or temporarily occupied by you with permission of the owner; or
- b. The contents of any premises while such premises is rented to you, if you rent such premises for a period of seven or tewer consecutive days.
- The following replaces Paragraph 4.b.(1)(b) of SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS:
  - (b) That is insurance for "premises damage"; or
- Paragraph 4.b.(1)(c) of SECTION IV COMMERCIAL GENERAL LIABILITY CON-DITIONS is deleted.

- C. INCREASED SUPPLEMENTARY PAYMENTS
  - 1. The following replaces Paragraph 1.b. of SUPPLEMENTARY PAYMENTS - COVER-AGES A AND B of SECTION I - COVER-AGE:
    - b. Up to \$2,500 for the cost of ball bonds required because of accidents or traffic law violations arising out of the use of any vehicle to which the Bodily Injury Liability Coverage applies. We do not have to fur nish these bonds.
  - 2. The following replaces Paragraph 1.d. of SUPPLEMENTARY PAYMENTS - COVER-AGES A AND B of SECTION I - COVER-AGES:
    - d. All reasonable expenses incurred by the insured at our request to assist us in the investigation or defense of the claim or "sult", including actual loss of earnings up to \$500 a day because of time off from work.

#### D. INCIDENTAL MEDICAL MALPRACTICE

 The following is added to the definition of "occurrence" in the DEFINITIONS Section;

"Occurrence" also means an act or omission committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to a person.

 The following is added to Paragraph 2.a.(1) of SECTION II – WHO IS AN INSURED:

Paragraph (1)(d) above does not apply to "bodily injury" arising out of providing or failing to provide:

- Incidental medical services" by any of your "employees" who is a nurse practitioner, registered nurse, licensed practical nurse, nurse assistant, emergency medical technician or paramedic; or
- (II) First aid or "Good Samaritan services" by any of your "employees" or "volunteer workers", other than an employed or volunteer doctor. Any such "employees" or "volunteer workers" providing or failing to provide first aid or "Good Samaritan services" during their work hours for you will be deemed to be acting within the scope of their employment by you or performing duties related to the conduct of your business.

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3. The following is added to Paragraph 5. of SECTION III - LIMITS OF INSURANCE:

For the purposes of determining the applicable Each Occurrence Limit, all related acts or omissions committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to any one person will be deemed to be one "occurrence".

4. The following exclusion is added to Paragraph 2., Exclusions, of SECTION I – COV-ERAGES – COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY:

Sale Of Pharmaceuticals

"Bodily injury" or "property damage" arising out of the willful violation of a penal statute or ordinance relating to the sale of pharmaceuticals committed by, or with the knowledge or consent of, the insured.

5. The following is added to the DEFINITIONS Section:

"Incidentel medical services" means:

- Medical, surgical, dental, laboratory, x-ray or nursing service or treatment, advice or instruction, or the related furnishing of food or beverages; or
- b. The furnishing or dispensing of drugs or medical, dental, or surgical supplies or appliances.

"Good Samaritan services" means any emergency medical services for which no compensation is demanded or received.

 The following is added to Paragraph 4.b., Excess Insurance, of SECTION IV – COM-MERCIAL GENERAL LIABILITY CONDI-TIONS:

The insurance is excess over any valid and collectible other insurance available to the insured, whether primary, excess, contingent or on any other basis, that is available to any of your "employees" or "volunteer workers" for "bodily injury" that arises out of providing or failing to provide "incidental medical services", first ald or "Good Samaritan services" to any person to the extent not subject to Paragraph 2.a.(1) of Section II – Who Is An Insured.

#### E. WHO IS AN INSURED - NEWLY ACQUIRED OR FORMED ORGANIZATIONS

The following replaces Paragraph 4. of SECTION II – WHO IS AN INSURED:

- 4. Any organization you newly acquire or form, other than a partnership, joint venture or limited liability company, of which you are the sole owner or in which you maintain the majority ownership interest, will qualify as a Named Insured if there is no other insurance which provides similar coverage to that organization. However:
- a. Coverage under this provision is afforded only:
  - (1) Until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier, if you do not report such organization in writing to us within 180 days after you acquire or form it; or
  - (2) Until the end of the policy period, when that date is later than 180 days after you acquire or form such organization, if you report such organization in writing to us within 180 days after you acquire or form it, and we agree in writing that it will continue to be a Named Insured until the end of the policy period;
- b. Coverage A does not apply to "bodily injury" or "property damage" that occurred before you acquired or formed the organization; and
- c. Coverage B does not apply to "personal injury" or "advertising injury" arising out of an offense committed before you acquired or formed the organization.

#### F. WHO IS AN INSURED - BROADENED NAMED INSURED - UNNAMED SUBSIDIARIES The following is added to SECTION II - WHO IS AN INSURED:

Any of your subsidiaries, other than a partnership, joint venture or limited liability company, that is not shown as a Named insured in the Declarations is a Named Insured if you maintain an ownership interest of more than 50% in such subsidiary on the first day of the policy period.

No such subsidiary is an insured for "bodily injury" or "property damage" that occurred, or "personal injury" or "advertising injury" caused by an offense committed after the date, if any, during the policy period, that you no longer maintain an ownership interest of more than 50% in such subsidiary.

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#### G. BLANKET ADDITIONAL INSURED - OWNERS, MANAGERS OR LESSORS OF PREMISES

The following is added to SECTION II - WHO IS AN INSURED:

Any person or organization that is a premises owner, manager or lessor and that you have agreed in a written contract or agreement to Include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" that:

- a. Is "bodily injury" or "property damage" that occurs, or is "personal injury" or "advertising injury" caused by an offense that is committed, subsequent to the execution of that contract or agreement; and
- b. Arises out of the ownership, maintenance or use of that part of any premises leased to you.

The insurance provided to such premises owner, manager or lessor is subject to the following provisions:

- a. The limits of insurance provided to such premises owner, manager or lessor will be the minimum limits which you agreed to provide in the written contract or agreement, or the limits shown on the Declarations, whichever are less.
- b. The insurance provided to such premises owner, manager or lessor does not apply to:
  - (1) Any "bodily injury" or "property damage" that occurs, or "personal injury" or "advertising injury" caused by an offense that is committed, after you cease to be a tenant in that premises; or
  - (2) Structural alterations, new construction or demolition operations performed by or on behalf of such premises owner, lessor or manager.
- c. The insurance provided to such premises owner, manager or lessor is excess over any valid and collectible other insurance available to such premises owner, manager or lessor, whether primary, excess, contingent or on any other basis, unless you have agreed in the written contract or agreement that this insurance must be primary to, or noncontributory with, such other insurance, in which case this insurance will be primary to, and non-contributory with, such other insurance.

#### H. BLANKET ADDITIONAL INSURED - LESSORS OF LEASED EQUIPMENT

#### The following is added to SECTION II - WHO IS AN INSURED:

Any person or organization that is an equipment lessor and that you have agreed in a written contract or agreement to include as an insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" that:

- a. Is "bodily injury" or "property damage" that occurs, or is "personal injury" or "advertising injury" caused by an offense that is committed, subsequent to the execution of that contract or agreement; and
- b. Is caused, in whole or in part, by your acts or omissions in the maintenance, operation or use of equipment leased to you by such equipment lessor.

The insurance provided to such equipment lessor is subject to the following provisions:

- a. The limits of insurance provided to such equipment lessor will be the minimum limits which you agreed to provide in the written contract or agreement, or the limits shown on the Declarations, whichever are less.
- b. The insurance provided to such equipment lessor does not apply to any "bodily injury" or "property damage" that occurs, or "personal injury" or "advertising injury" caused by an offense that is committed, after the equipment lease expires.
- c. The Insurance provided to such equipment lessor is excess over any valid and collectible other insurance available to such equipment lessor, whether primary, excess, contingent or on any other basis, unless you have agreed in the written contract or agreement that this insurance must be primary to, or non-contributory with, such other insurance, in which case this insurance will be primary to, and non-contributory with, such other insurance.

#### I. BLANKET ADDITIONAL INSURED - STATES OR POLITICAL SUBDIVISIONS - PERMITS

#### The following is added to SECTION II - WHO IS AN INSURED:

Any state or political subdivision that has issued a permit in connection with operations performed by you or on your behalf and that you are required

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by any ordinance, law or building code to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" arising out of such operations.

The insurance provided to such state or political subdivision does not apply to:

- Any "bodily injury," "property damage," "personal injury" or "advertising injury" arising out of operations performed for that state or political subdivision; or
- Any "bodily injury" or "property damage" Included in the "products-completed operations hazard".
- J. KNOWLEDGE AND NOTICE OF OCCUR-RENCE OR OFFENSE

The following is added to Paragraph 2., Duties In The Event of Occurrence, Offense, Claim or Suit, of SECTION IV – COMMERCIAL GEN-ERAL LIABILITY CONDITIONS:

- e. The following provisions apply to Paragraph a, above, but only for the purposes of the insurance provided under this Coverage Part to you or any insured listed in Paragraph 1, or 2, of Section II – Who Is An Insured:
  - (1) Notice to us of such "occurrence" or offense must be given as soon as practicable only after the "occurrence" or offense is known by you (if you are an individual), any of your partners or members who is an individual (if you are a partnership or joint venture), any of your managers who is an individual (if you are a limited liability company), any of your "executive officers" or directors (if you are an organization other than a partnership, joint venture or limited liability company) or any "employee" authorized by you to give notice of an "occurrence" or offense.
  - (2) If you are a partnership, joint venture or limited liability company, and none of your partners, joint venture members or managers are individuals, notice to us of such "occurrence" or offense must be given as soon as practicable only after the "occurrence" or offense is known by:
    - (a) Any individual who is:
      - (I) A partner or member of any partnership or joint venture;

#### COMMERCIAL GENERAL LIABILITY

- (II) A manager of any limited liability company; or
- (III) An executive officer or director of any other organization;
- that Is your partner, joint venture member or manager; or
- (b) Any "employee" authorized by such partnership, joint venture, limited liability company or other organization to give notice of an "occurrence" or offense.
- (3) Notice to us of such "occurrence" or of an offense will be deemed to be given as soon as practicable if it is given in good faith as soon as practicable to your workers' compensation insurer. This applies only if you subsequently give notice to us of the "occurrence" or offense as soon as practicable after any of the persons described in Paragraphs e. (1) or (2) above discovers that the "occurrence" or offense may result in sums to which the insurance provided under this Coverage Part may apply.

However, if this Coverage Part includes an endorsement that provides limited coverage for "bodily injury" or "property damage" or pollution costs arising out of a discharge, release or escape of "pollutants" which contains a requirement that the discharge, release or escape of "pollutants" must be reported to us within a specific number of days after its abrupt commencement, this Paragraph e. does not affect that requirement.

#### K. UNINTENTIONAL OMISSION

The following is added to Paragraph 5., Representations, of SECTION W – COMMERCIAL GENERAL LIABILITY CONDITIONS:

The unintentional omission of, or unintentional error in, any information provided by you which we relied upon in issuing this policy will not prejudice your rights under this insurance. However, this provision does not affect our right to collect additional premium or to exercise our rights of cancellation or nonrenewal in accordance with applicable insurance laws or regulations.

#### L. BLANKET WAIVER OF SUBROGATION

The following is added to Paragraph 8., Transfer Of Rights Of Recovery Against Others To Us, of SECTION IV – COMMERCIAL GENERAL LI-ABILITY CONDITIONS:

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If the insured has agreed in a contract or agreement to waive that insured's right of recovery against any person or organization, we walve our right of recovery against such person or organization, but only for payments we make because of:

- "Bodily Injury" or "property damage" that occurs; or
- b. "Personal injury" or "advertising injury" caused by an offense that is committed;

subsequent to the execution of that contract or agreement.

#### M. AMENDED BODILY INJURY DEFINITION

The following replaces the definition of "bodily injury" in the DEFINITIONS Section:  "Bodily injury" means bodily injury, mental angulsh, mental injury, shock, fright, disability, humilitation, sickness or disease sustained by a person, including death resulting from any of these at any time.

#### N. CONTRACTUAL LIABILITY - RAILROADS

- The following replaces Paragraph c. of the definition of "insured contract" in the DEFINI-TIONS Section:
  - c. Any easement or license agreement;
- Paragraph f.(1) of the definition of "insured contract" in the DEFINITIONS Section is deleted.

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COMMERCIAL AUTO

#### THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.

## BUSINESS AUTO EXTENSION ENDORSEMENT

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to the Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an environment. The following listing is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

- A. BROAD FORM NAMED INSURED
- **B. BLANKET ADDITIONAL INSURED**
- C. EMPLOYEE HIRED AUTO
- D. EMPLOYEES AS INSURED
- E. SUPPLEMENTARY PAYMENTS INCREASED LIMITS
- F. HIRED AUTO LIMITED WORLDWIDE COV-ERAGE - INDEMNITY BASIS
- G. WAIVER OF DEDUCTIBLE GLASS

#### PROVISIONS

A. BROAD FORM NAMED INSURED

The following is added to Paragraph A.1., Who is An Insured, of SECTION II – COVERED AUTOS LIABILITY COVERAGE:

Any organization you newly acquire or form during the policy period over which you maintain 50% or more ownership interest and that is not separately insured for Business Auto Coverage. Coverage under this provision is afforded only until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier.

#### **B. BLANKET ADDITIONAL INSURED**

The following is added to Paragraph c. in A.1., Who is An Insured, of SECTION II – COVERED AUTOS LIABILITY COVERAGE:

Any person or organization who is required under a written contract or agreement between you and that person or organization, that is signed and executed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, to be named as an addltional insured is an "insured" for Covered Autos Liability Coverage, but only for damages to which

- H. HIRED AUTO PHYSICAL DAMAGE -- LOSS OF USE -- INCREASED LIMIT
- I. PHYSICAL DAMAGE TRANSPORTATION EXPENSES - INCREASED LIMIT
- J. PERSONAL PROPERTY
- K. AIRBAGS
- L. NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS
- M. BLANKET WAIVER OF SUBROGATION
- N. UNINTENTIONAL ERRORS OR OMISSIONS

this insurance applies and only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Section II.

#### C. EMPLOYEE HIRED AUTO

1. The following is added to Paragraph A.1., Who is An Insured, of SECTION II - COV-ERED AUTOS LIABILITY COVERAGE:

An "employee" of yours is an "insured" while operating an "auto" hired or rented under a contract or agreement in an "employee's" name, with your permission, while performing duties related to the conduct of your business,

- 2. The following replaces Paragraph b. in B.S., Other Insurance, of SECTION IV – BUSI-NESS AUTO CONDITIONS:
  - b. For Hired Auto Physical Damage Coverage, the following are deemed to be covared "autos" you own:
    - Any covered "auto" you lease, hire, rent or borrow; and
    - (2) Any covered "auto" hired or rented by your "employee" under a contract in an "employee's" name, with your

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#### COMMERCIAL AUTO

permission, while performing duties related to the conduct of your business,

However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto".

D. EMPLOYEES AS INSURED

The following is added to Paragraph A.1., Who is An Insured, of SECTION II – COVERED AUTOS LIABILITY COVERAGE:

Any "employee" of yours is an "insured" while using a covered "auto" you don't own, hire or borrow in your business or your personal affairs.

- E. SUPPLEMENTARY PAYMENTS INCREASED LIMITS
  - 1. The following replaces Paregraph A.2.a.(2), of SECTION II – COVERED AUTOS LIABIL-ITY COVERAGE:
    - (2) Up to \$3,000 for cost of bail bonds (Including bonds for related traffic law violations) required because of an "accident" we cover, We do not have to furnish these bonds.
  - 2. The following replaces Paragraph A.2.a.(4), of SECTION II – COVERED AUTOS LIABIL-ITY COVERAGE:
    - (4) All reasonable expenses incurred by the "insured" at our request, including actual loss of earnings up to \$500 a day because of time off from work.

#### F. HIRED AUTO -- LIMITED WORLDWIDE COV-ERAGE -- INDEMNITY BASIS

The following replaces Subparagraph (5) in Paragraph 8.7., Policy Period, Coverage Territory, of SECTION IV – BUSINESS AUTO CONDI-TIONS;

(5) Anywhere in the world, except any country or jurisdiction while any trade sanction, embargo, or similar regulation imposed by the United States of America applies to and prohibits the transaction of business with or within such country or jurisdiction, for Covered Autos Liability Coverage for any covered "auto" that you lease, hire, rent or borrow without a driver for a period of 30 days or less and that is not an "auto" you lease, hire, rent or borrow from any of your "employees", partners (if you are a partnership), members (if you are a limited liability company) or members of their households.

- (a) With respect to any claim made or "suit" brought outside the United States of America, the territories and possessions of the United States of America, Puerto Rico and Canada:
  - (I) You must arrange to defend the "insured" against, and investigate or settle any such claim or "suit" and keep us advised of all proceedings and actions.
  - (ii) Neither you nor any other involved "insured" will make any settlement without our consent.
  - (III) We may, at our discretion, participate in defending the "insured" against, or in the settlement of, any claim or "sult".
  - (iv) We will reimburse the "insured" for sums that the "insured" legally must pay as damages because of "bodily injury" or "property damage" to which this insurance applies, that the "insured" pays with our consent, but only up to the limit described in Paragraph C., Limits Of Insurance, of SECTION II - COVERED AUTOS LIABILITY COVERAGE.
  - (v) We will reimburse the "insured" for the reasonable expenses incurred with our consent for your investigation of such claims and your defense of the "insured" against any such "suit", but only up to and included within the limit described in Paragraph C., Limits Of Insurance, of SECTION II - COVERED AUTOS LIABILITY COVERAGE, and not in addition to such limit. Our duty to make such payments ends when we have used up the applicable limit of insurance in payments for damages. settlements or defense expenses.
- (b) This insurance is excess over any valid and collectible other insurance available to the "insured" whether primary, excess, contingent or on any other basis.
- (c) This insurance is not a substitute for required or compulsory insurance in any country outside the United States, its territories and possessions, Puerto Rico and Canada.

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You agree to maintain all required or compulsory insurance in any such country up to the minimum limits required by local law. Your failure to comply with compulsory insurance requirements will not invatidate the coverage afforded by this policy, but we will only be liable to the same extent we would have been liable had you complied with the compulsory insurance requirements.

(d) It is understood that we are not an admitted or authorized insurar outside the United States of America, its territories and possessions, Puerto Rico and Canada. We assume no responsibility for the furnishing of certificates of insurance, or for compliance in any way with the laws of other countries relating to insurance.

#### G. WAIVER OF DEDUCTIBLE - GLASS

The following is added to Paragraph D., Deductible, of SECTION III - PHYSICAL DAMAGE COVERAGE:

No deductible for a covered "auto" will apply to glass damage if the glass is repaired rather than replaced.

H. HIRED AUTO PHYSICAL DAMAGE - LOSS OF USE - INCREASED LIMIT

The following replaces the last sentence of Paragraph A.4.b., Loss Of Use Expenses, of SEC-TION III – PHYSICAL DAMAGE COVERAGE:

However, the most we will pay for any expenses for loss of use is \$65 per day, to a maximum of \$750 for any one "accident".

I. PHYSICAL DAMAGE - TRANSPORTATION EXPENSES - INCREASED LIMIT

The following replaces the first sentence in Paragraph A.4.a., Transportation Expenses, of SECTION III - PHYSICAL DAMAGE COVER-AGE:

We will pay up to \$50 per day to a maximum of \$1,500 for temporary transportation expense incurred by you because of the total theft of a covered "auto" of the private passenger type.

#### J. PERSONAL PROPERTY

The following is added to Paragraph A.4., Coverage Extensions, of SECTION III - PHYSICAL DAMAGE COVERAGE:

#### **Personal Property**

We will pay up to \$400 for "loss" to wearing epparel and other personal property which is:

(1) Owned by an "insured"; and

(2) In or on your covered "auto".

This coverage applies only in the event of a total theft of your covered "auto".

No deductibles apply to this Personal Property coverage.

#### K. AIRBAGS

The following is added to Paragraph B.3., Exclusions, of SECTION III - PHYSICAL DAMAGE COVERAGE:

Exclusion 3.a. does not apply to "loss" to one or more airbags in a covered "auto" you own that inflate due to a cause other than a cause of "loss" set forth in Paragraphs A.1.b. and A.1.c., but only:

- a. If that "auto" is a covered "auto" for Comprehensive Coverage under this policy;
- b. The airbags are not covered under any warranty; and
- c. The alrbags were not intentionally inflated.

We will pay up to a maximum of \$1,000 for any one "loss".

L. NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS

The following is added to Paragraph A.2.a., of SECTION IV - BUSINESS AUTO CONDITIONS:

Your duty to give us or our authorized representative prompt notice of the "accident" or "loss" applies only when the "accident" or "loss" is known to:

- (a) You (if you are an Individual);
- (b) A partner (if you are a partnership);
- (c) A member (if you are a limited liability company);
- (d) An executive officer, director or insurance manager (if you are a corporation or other organization); or
- (e) Any "employee" authorized by you to give notice of the "accident" or "loss".

#### M. BLANKET WAIVER OF SUBROGATION

The following replaces Paragraph A.S., Transfer Of Rights Of Recovery Against Others To Us, of SECTION IV - BUSINESS AUTO CONDI-TIONS:

#### 5. Transfer Of Rights Of Recovery Against Others To Us

We walve any right of recovery we may have against any person or organization to the extent required of you by a written contract signed and executed prior to any "accident" or "loss", provided that the "accident" or "loss" arises out of operations contemplated by

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#### COMMERCIAL AUTO

such contract. The waiver applies only to the person or organization designated in such contract.

#### N. UNINTENTIONAL ERRORS OR OMISSIONS

The following is added to Paragraph B.2., Conceatment, Misrepresentation, Or Fraud, of SECTION IV - BUSINESS AUTO CONDITIONS: The unintentional omission of, or unintentional error in, any information given by you shall not prejudice your rights under this insurance. However this provision does not affect our right to collect additional premium or exercise our right of cancellation or non-renewal.

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### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## BLANKET ADDITIONAL INSURED – PRIMARY AND NON-CONTRIBUTORY WITH OTHER INSURANCE

#### This endorsement modifies insurance provided under the following BUSINESS AUTO COVERAGE FORM

#### PROVISIONS

1. The following is added to Paragraph A.1.c., Who is An Insured, of SECTION II - COVERED AUTOS LIABILITY COVERAGE:

This includes any person or organization who you are required under a written contract or agreement between you and that person or organization, that is signed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, to name as an additional insured for Covered Autos Liability Coverage, but only for damages to which this insurance applies and only to the extent of that person's or organization's liability for the conduct of another "insured". 2. The following is added to Paragraph B.5., Other Insurance of SECTION IV – BUSINESS AUTO CONDITIONS:

Regardless of the provisions of paragraph a. and paragraph d. of this part 5. Other Insurance, this insurance is primary to and non-contributory with applicable other insurance under which an additional insured person or organization is the first named insured when the written contract or agreement between you and that person or organization, that is signed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, requires this insurance to be primary and non-contributory.

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(Ed. 4-84)

#### WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

Blanket Waiver of Subrogation Any & All Nevada Projects

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated. (The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

| Endorsement Effective Date: 01/01/2018 Policy No. WC 92834843464 | Endorsement No. |
|------------------------------------------------------------------|-----------------|
| Policy Effective Date: 01/01/2018 to 01/01/2019                  | Premium \$      |
| Insured: Sierra Nevada Construction, Inc.                        |                 |
| DBA:                                                             |                 |
| Carrier Name / Code: Argonaut Midwest Insurance Company          | Africa          |

WC 00 03 13 (Ed. 4-84)

Countersigned by

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Page 1 of 1

#### WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT- CALIFORNIA

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

You must maintain payroll records accurately segregating the remuneration of your employees while engaged in the work described in the Schedule.

The additional premium for this endorsement shall be \_\_\_\_\_0.020% of the California workers' compensation premium otherwise due on such remuneration.

Schedule

Person or Organization

Blanket Waiver of Subrogation

**Job Description** 

Any & All California Projects

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated. (The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

| Endorsement Effective Date: 01/01/2018 Policy No. WC 928348434644 | Endorsement No. |
|-------------------------------------------------------------------|-----------------|
| Policy Effective Date: 01/01/2018 to 01/01/2019                   | Premium \$      |
| Insured: Sierra Nevada Construction, Inc.                         |                 |
| DBA:                                                              | Pb              |
| Carrier Name / Code: Argonaut Midwest Insurance Company           | NP              |

Countersigned by

WC 04 03 06 (Ed. 4-84)

Page 1 of 1

POLICY NUMBER: VTC2OCO5644B111COF17

#### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## DESIGNATED ENTITY - NOTICE OF CANCELLATION PROVIDED BY US

This endorsement modifies insurance provided under the following: ALL COVERAGE PARTS INCLUDED IN THIS POLICY

#### SCHEDULE

CANCELLATION:

Number of Days Notice of Cancellation: 60

#### PERSON OR ORGANIZATION:

Any person or organization to whom you have agreed in a written contract that notice of cancellation of this policy will be given, but only if: 1. You send us a written request to provide such notice, including the

name and address of such person or organization, after the first Named Insured receives notice from us of the cancellation of this policy; and

2. We receive such written request at least 14 days before the beginning of the applicable number of days shown in this endorsement.

#### ADDRESS:

The address for that person or organization included in such written request from you to us.

#### **PROVISIONS:**

If we cancel this policy for any statutorily permitted reason other than nonpayment of premium, and a number of days is shown for cancellation in the schedule above, we will mail notice of cancellation to the person or organization shown in the schedule above. We will mail such notice to the address shown in the schedule above at least the number of days shown for cancellation in the schedule above before the effective date of cancellation.

IL T4 05 03 11

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Page 1 of 1



Premium: Included in payment bond

| PERFORMANCE BOND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                 | Bond 07002                                  | 5524                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| KNOW ALL BY THESE PRESENTS, T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | That we, Sierra Nevada Cons                                                                                     | struction, Inc.                             |                                                                                                                 |
| (hereinafter called the Principal), as Principal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | cipal, and Liberty Mutual Inst                                                                                  | urance Company                              | , a corporation                                                                                                 |
| duly organized under the laws of the Stat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | e of Massachusetts                                                                                              | (hereinafter called the Surety), as Sur     | ety, are held and firmly                                                                                        |
| bound unto County of Fresno                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | di Chimmen                                                                                                      | -                                           |                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                 | , (hereina)                                 | fter called the Obligee),                                                                                       |
| in the sum of One Million One Hundre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | d Eight Thousand Five Hun                                                                                       | dred Thirty-one Dollars And Seventy-        | five Cents                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (\$1,108,531.75                                                                                                 | ) Dollars, for the payment of wh            | nich sum well and truly                                                                                         |
| to be made, we, the said Principal and<br>jointly and severally, firmly by these pres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | the said Surety, bind ourselve<br>sents.                                                                        | es, our heirs, executors, administrators, s | successors and assigns,                                                                                         |
| Signed and sealed this 29th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | day of May                                                                                                      | , 2018                                      |                                                                                                                 |
| WHEREAS, said Principal has entered int                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | o a written Contract with said (                                                                                | Obligee, dated                              |                                                                                                                 |
| for Bituminous Seal Coats Various Lo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ocations in Fresno County; (                                                                                    | Contract Number: 17-25-C                    |                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                 |                                             |                                                                                                                 |
| . <del>General and a second s</del> |                                                                                                                 |                                             |                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ana ana amin'ny fisiana dia kaodim-paositra dia kaodim-paositra dia kaodim-paositra dia kaodim-paositra dia kao | nen an  | ferendenne felgeferigtet for solder for all for all for all for a solder solder and a solder and a solder and a |
| in accordance with the terms and conditi<br>herein:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ions of said Contract, which i                                                                                  | s hereby referred to and made a part here   | eof as if fully set forth                                                                                       |
| NOW, THEREFORE, THE CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | N OF THIS OBLIGATION IS                                                                                         | SUCH, That if the above bounden Princi      | pal shall well and truly<br>specified to be by said                                                             |

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, That it the above bounden Principal shall well and truly keep, do and perform each and every, all and singular, the matters and things in said contract set forth and specified to be by said Principal kept, done and performed, at the times and in the manner in said contract specified, or shall pay over, make good and reimburse to the above named Obligee, all loss and damage which said Obligee may sustain by reason of failure or default on the part of said Principal so to do, then this obligation shall be null and void; otherwise shall remain in full force and effect.

NO SUIT, ACTION OR PROCEEDING by the Obligee to recover on this bond shall be sustained unless the same be commenced within two (2) years following the date on which Principal ceased work on said Contract.

|                                                                                                                                                          | Sierra Nevada Construction, Inc.                                                        |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------|
| LUAL INSURATION<br>LUAL INSURATION<br>1912<br>LUAL CORPORATION<br>1912<br>LUAL CORPORATION<br>1912<br>LUAL INSURATION<br>1912<br>LUAL INSURATION<br>1912 | By Liberty Mutual Insurance Company<br>By Man Conformation<br>Abdrea M Cantlon, Attorne | Principal |
|                                                                                                                                                          |                                                                                         |           |

| ALL-PUI                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State of Nevada                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                               |
| County of Washoe                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                               |
| On <u>531208</u> before m                                                                                                            | ne, Melanie Steelman                                                                                                                                                                                                                                                                                                                                                                                          |
| personally appeared                                                                                                                  | Marc Markwell                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                      | NAME(S) OF SIGNER(S)                                                                                                                                                                                                                                                                                                                                                                                          |
| personally known to me OR Xp                                                                                                         | roved to me on the basis of satisfactory evidence to be the<br>person(s) whose name(s) is/are subscribed to the within<br>instrument and acknowledged to me that he/she/they<br>executed the same in his/her/their authorized<br>capacity(ies), an that by his/her/their signature(s) on the<br>instrument the person(s), or the entity upon behalf of<br>which the person(s) acted, executed the instrument. |
| MELANIE STEELMAN<br>Notary Public - State of Nevada<br>Appointment Recorded in Washoe County<br>No: 00-64170-2 - Expires May 3, 2022 | WITNESS my hand and official seal.                                                                                                                                                                                                                                                                                                                                                                            |
| Place Notary Seal or Stamp Here                                                                                                      | SIGNATURE OF NOTARY                                                                                                                                                                                                                                                                                                                                                                                           |
| ATTENTION NOTARY: Although the informati relying on this Acknowledgment and could prev                                               | on requested below is OPTIONAL, it may prove valuable to persons<br>vent fraudulent reattachment of this certificate to another document.                                                                                                                                                                                                                                                                     |
| D                                                                                                                                    | ESCRIPTION OF ATTACHED DOCUMENT                                                                                                                                                                                                                                                                                                                                                                               |
| THIS CERTIFICATE<br>MUST BE ATTACHED<br>TO THE DOCUMENT                                                                              | Performance Band<br>TITLE OR TYPE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                 |
| DESCRIBED AT RIGHT                                                                                                                   | NUMBER OF PAGES                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                      | SIGNER(S) OTHER THAN NAMED ABOVE                                                                                                                                                                                                                                                                                                                                                                              |

|                                                                                                                                                                                                                                                                                                                                                                                                                                        | — 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COUNTY OF                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| On 05/29/2018 before me. Cassandra Me                                                                                                                                                                                                                                                                                                                                                                                                  | edina, Notary Public<br>(here insert name of notary)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Andrea M Cantlon                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                        | (name(s) of Signer(s))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| personally known to me (or proved to me on the basis of s<br>subscribed to the within instrument and acknowledged to m<br>capacity(ies), and that by his/her/their signature(s) on the<br>person(s) acted, executed the instrument.                                                                                                                                                                                                    | satisfactory evidence) to be the person(s) whose name(s) is/a<br>ne that he/she/they executed the same in his/her/their authoriz<br>instrument the person(s), or the entity upon behalf of which the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| WITNESS my hand and official seal.                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Signature Cassenala Medicie (SEAL                                                                                                                                                                                                                                                                                                                                                                                                      | CASSANDRA MEDINA<br>Notary Public - State of Nevada<br>Appointment Recorded in Washoe County<br>No: 17-4072-2 - Expires November 20, 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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ALL-PURPOSE ACKNOWLEDGEM

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND. This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Certificate No. 8086016 Liberty Mutual Insurance Company West American Insurance Company The Ohio Casualty Insurance Company POWER OF ATTORNEY KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Lori Jones: Andrea M. Cantlon; Cassandra Medina; Patricia Owens; Nicholas D. Rossi; Teri L. Wood each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge all of the city of Reno , state of NV and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons. IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any husiness day thereto this 3rd day of May 2018 The Ohio Casualty Insurance Company Liberty Mutual Insurance Company 1919 1912 1991 West American Insurance Company interest rate or residual value guarantees. By: David M. Carev, Assistant Secretary STATE OF PENNSYLVANIA SS COUNTY OF MONTGOMERY On this 3rd day of May \_2018., before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written PAST COMMONWEALTH OF PENNSYLVANIA Notarial Seal Teresa Pastella, Notary Public Upper Merion Twp., Montgomery County Teresa Pastella, Notary Publi My Commission Expires March 28, 2021 ar Pennsylvania Association of Notarie ARV PU this This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows: ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective currency rate, powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority. ARTICLE XIII - Execution of Contracts - SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attack thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary. Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-infact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed. t, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked. day of IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this O

Renee C. Llewellyn, Assistant Secretary

1991

1999

Not valid for mortgage, note, loan, letter of credit,

PAYMENT BOND - PUBLIC WORK SECTIONS 3247 - 3252, CIVIL CODE (CALIFORNIA)

> Bond No. 070025524 Premium:` \$4,806.00

#### KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, The County of Fresno has awarded to Sierra Nevada Construction, Inc.

as Contractor, a contract for the work described as follows: Bituminous Seal Coats Various Locations in Fresno County; 17-25-C

AND WHEREAS, Said Contractor is required to furnish a bond in connection with said contract, to secure the payment of claims of laborers, mechanics, materialmen, and other persons as provided by law.

NOW, THEREFORE, We the undersigned Contractor and Surety are held and firmly bound unto the <u>County of Fresno</u> in the amount required by law, the sum of \$<u>1,108,531.75</u>, for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

#### THE CONDITION OF THIS OBLIGATION IS SUCH,

That if said Contractors shall fail to pay (1) Any of the persons named in Civil Code Section 3181, (2) amounts due under the Unemployment Insurance Code for work or labor performed in connection with said contract by any such claimant, or (3) any amounts required to be deducted, withheld and paid over to the Employment Development Department and to the Franchise Tax Board from wages of the employees of Contractor and his sub-contractors with respect to such work and labor, pursuant to Section 13020 of the Unemployment Insurance Code, then the Surety or Sureties herein will pay for the same in an aggregate amount not exceeding the sum specified in this bond, and also in case suit is brought upon the bond, a reasonable attorney's fee, to be fixed by the court, otherwise the above obligation shall be void.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181 so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

This bond is executed and filed to comply with the provisions of the act of Legislature of the State of California as designated in Civil Code, Sections 3247 - 3252 inclusive, and all amendments thereto.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this <u>29th</u> day of <u>May</u>, <u>2018</u>.

Sierra Nevada Construction, Inc. Contractor

Liberty Mutual Insurance Company SUFLETY COMPANY

Andrea M Cantlon, Attorney-In-Fact

| ALL-PURPOSE ACKNOWLEDGMENT                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| State of Nevada                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
| County of Washoe                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
| On 531 2018 before n                                                                                                                                                                                                       | ne, Melanie Steelman                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| personally appeared                                                                                                                                                                                                        | Marc Markwell                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |
|                                                                                                                                                                                                                            | NAME(S) OF SIGNER(S)                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| personally known to me OR X p                                                                                                                                                                                              | roved to me on the basis of satisfactory evidence to be the<br>person(s) whose name(s) is/are subscribed to the within<br>instrument and acknowledged to me that he/she/they<br>executed the same in his/her/their authorized<br>capacity(ies), an that by his/her/their signature(s) on the<br>instrument the person(s), or the entity upon behalf of<br>which the person(s) acted, executed the instrument. |  |  |
| MELANIE STEELMAN<br>Notary Public - State of Nevada<br>Appointment Recorded in Washoe County<br>No: 00-64170-2 - Expires May 3, 2022                                                                                       | WITNESS my hand and official seal.                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| Place Notary Seal or Stamp Here                                                                                                                                                                                            | SIGNATURE OF NOTARY                                                                                                                                                                                                                                                                                                                                                                                           |  |  |
| ATTENTION NOTARY: Although the information requested below is OPTIONAL, it may prove valuable to persons relying on this Acknowledgment and could prevent fraudulent reattachment of this certificate to another document. |                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
| DESCRIPTION OF ATTACHED DOCUMENT                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
|                                                                                                                                                                                                                            | Payment Bond                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |
| THIS CERTIFICATE<br>MUST BE ATTACHED<br>TO THE DOCUMENT<br>DESCRIBED AT RIGHT                                                                                                                                              | TITLE OR TYPE OF DOCUMEN'T                                                                                                                                                                                                                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                            | NUMBER OF PAGES                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
|                                                                                                                                                                                                                            | 5/29/2018                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |
|                                                                                                                                                                                                                            | DATE OF DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                              |  |  |
|                                                                                                                                                                                                                            | SIGNER(S) OTHER THAN NAMED ABOVE                                                                                                                                                                                                                                                                                                                                                                              |  |  |

| COUNTY OF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| On 05/29/2018 , before me, Cassandra N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (here insert name of notary)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| personally appeared Andrea M Cantion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (name(s) of Signer(s))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| personally known to me (or proved to me on the basis of<br>subscribed to the within instrument and acknowledged to<br>capacity(ies), and that by his/her/their signature(s) on the<br>person(s) acted, executed the instrument.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | f satisfactory evidence) to be the person(s) whose name(s) is/<br>me that he/she/they executed the same in his/her/their authoriz<br>a instrument the person(s), or the entity upon behalf of which                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| WITNESS my hand and official seal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| signature assended Meaners                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ALJ<br>CASSANDRA MEDINA<br>Notary Public - State of Nevada<br>Appointment Recorded in Washoe County<br>No: 17-4072-2 - Expires November 20, 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2.*<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | This area for Official Notarial Seal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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1232(REV. 5/09)

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ALL-PURPOSE ACKNOWLEDGEM

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND. This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Certificate No. 8086017 Liberty Mutual Insurance Company The Ohio Casualty Insurance Company West American Insurance Company POWER OF ATTORNEY KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Lori Jones; Andrea M. Cantlon; Cassandra Medina; Patricia Owens; Nicholas D. Rossi; Teri L. Wood , state of NV each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge all of the city of Reno and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons. IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 3rd day of May 2018 To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 nm FST on any husiness day IM INS INSI The Ohio Casualty Insurance Company Liberty Mutual Insurance Company 1919 1912 1991 West American Insurance Company rate, interest rate or residual value guarantees. Ry. David M. Carey, Assistant Secretary STATE OF PENNSYLVANIA SS COUNTY OF MONTGOMERY On this 3rd day of May ., 2018., before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written. PAS COMMONWEALTH OF PENNSYLVANIA Notarial Seal Teresa Pasteila, Notary Public OF Upper Merion Twp., Montgomery County Teresa Pastella, Notary Public My Commission Expires March 28, 2021 Member, Pennsylvania Association of Notaries ARY PUT This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows: ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority. currencv ARTICLE XIII - Execution of Contracts - SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president. and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary. Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-infact as may be necessary to act on behalf of the Company to make; execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed. I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked. IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this day of

LMS\_12873 022017

Not valid for mortgage, note, loan, letter of credit,

Renee C: Llewellyn, Assistant Secretary

## SURETY VERIFICATION

| (Complete and return with Performance and Payment Bonds)                                                  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| PROJECT FRESHD COUNTY-BITUMINOUS SEAR COATS                                                               |  |  |  |  |  |
| Contract No. 17-25-C SNC 00B# 56665                                                                       |  |  |  |  |  |
| Contractor SERRA NEVAMA CONSTRUCTION, INC.                                                                |  |  |  |  |  |
| Contact Person MELANIE STEEMAN Phone No. (115) 355-0120                                                   |  |  |  |  |  |
| SURETY COMPANY (Exact Name Style, Home Office Address)                                                    |  |  |  |  |  |
| LIBERTY MUTURE INSURANCE COONPANY                                                                         |  |  |  |  |  |
| 1001 4TH AVENNE                                                                                           |  |  |  |  |  |
| SEATTLE, WA 98154                                                                                         |  |  |  |  |  |
| AGENT / BROKER                                                                                            |  |  |  |  |  |
| Attorney-in-fact ANDREA M. CANTLON Phone No. (115)336-1997                                                |  |  |  |  |  |
| Firm LP INSURANCE SERVICES, INC.                                                                          |  |  |  |  |  |
| Mail Address 300 EAST 2ND STREET, #1300                                                                   |  |  |  |  |  |
| City, State, ZIP_RENO, NV 89501                                                                           |  |  |  |  |  |
| CA Dept of Insurance License No. <u>0407392</u> Expires <u>8 1 31 1 18</u><br>(or attach copy of License) |  |  |  |  |  |
|                                                                                                           |  |  |  |  |  |
| Owner's use only                                                                                          |  |  |  |  |  |
| Received 6 1 6 1 2018 By Mut                                                                              |  |  |  |  |  |
| Surety admitted 8 / 30 / 1929                                                                             |  |  |  |  |  |
| Surety Best's Class XV Rating A                                                                           |  |  |  |  |  |
| Comments                                                                                                  |  |  |  |  |  |
|                                                                                                           |  |  |  |  |  |

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# California Department of Insurance

## L/P INSURANCE SERVICES, INC.

License # 0H07392

Pursuant to the requirements of the State of California Insurance Code, L/P INSURANCE SERVICES, INC. is authorized to act in the following capacity:

| License                         | Effective Date | Expiration Date |
|---------------------------------|----------------|-----------------|
| Non-Resident Insurance Producer | 08/20/2010     | 08/31/2018      |
| Qualifications                  |                |                 |
| Accident and Health Agent       | 08/20/2010     |                 |
| Casualty Broker-Agent           | 08/20/2010     |                 |
| Life-Only Agent                 | 08/20/2010     |                 |
| Property Broker-Agent           | 08/20/2010     |                 |
| Surplus Lines Broker            | 07/15/2014     |                 |
|                                 |                |                 |

Business Address: 300 E. 2nd Street, Suite 1300, Reno, Nevada 89501

Dave Jones Insurance Commissioner



Please note: To validate the accuracy of this license you may review the individual or business entity's license record on the California Department of Insurance's website at www.insurance.ca.gov "Check License Status."