NOTICE TO CONTRACTORS, SPECIAL PROVISIONS, AND CONSTRUCTION CONTRACT

FOR

WEST MAIN STREET REHABILITATION PROJECT
PROJECT NO. 14-16
NOTICE TO CONTRACTORS

Sealed proposals for the work shown on the plans entitled:

WEST MAIN STREET REHABILITATION PROJECT
PROJECT NO. 14-16

Bids will be received at the City of Grass Valley, Engineering Division, 125 East Main Street, Grass Valley, CA 95945 until 3:30 P.M. on March 17, 2015, at which time they will be publicly opened and read aloud at said address. Any Protest regarding the award of the contract must be submitted pursuant to the instructions stated in the special provisions.

GENERAL WORK DESCRIPTION:

The scope of work, in general, includes; installation of concrete sidewalk, curb, gutter and accessible ramps, hot mix asphalt paving and pavement marking modifications. Other related items not mentioned above, that are required by the plans, specifications or these Special Provisions shall be performed, placed, constructed, or installed.

Project Location: West Main Street between South Auburn Street and North School Street, in Grass Valley, California

The Engineer's estimate for this project is $270,000.00.

The time of completion shall consist of 20 Working Days

BID INFORMATION:

Bids are required for the entire work described herein. The City of Grass Valley reserves the right to postpone the date and time for the opening of proposals at any time prior to the date and time announced in the advertisement in accordance with applicable law.

No pre-bid meeting is scheduled for this project.

The City of Grass Valley reserves the right to reject any and all bids or to waive any minor defects or irregularity in bidding in accordance with applicable law. In accordance with California Public Contract Code Section 20103.8, if the City elects to award a contract for performance of the project, the contract will be awarded in accordance with California Public Contract Code Section 20162 and other applicable law to the responsible bidder submitting a responsive bid with the lowest total bid price for the base bid without consideration of the bid price for any additive or deductive items. All bids will remain valid for 90 days after the bid opening. Except as permitted by law and subject to all applicable remedies, including forfeiture of bidder’s security, bidders may not withdraw their bid during the 90 day period after the bid opening.

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

Attention is directed to the requirements specified in Section 3-1.06, "Contractor License", of the Standard Specifications. The Contractor shall possess a valid California Class “A” Contractor's License, or a combination of the following classes: C8 - Concrete Contractor, C10 – Electrical Contractor, C12 - Earthwork and Paving Contractors, C31 - Construction Zone Traffic Control Contractor, C32 - Parking and Highway Improvement
Contractor, C45 - Sign Contractor and D-63 Construction Cleanup Contractor, and all other classes required by the categories and types of work included in the contract at the time of the bid award. All licenses shall remain in effect throughout the term of the contract.

Plans, specifications and proposal forms for bidding this project can be obtained directly from the City of Grass Valley, Engineering Division, 125 E. Main Street, Grass Valley, CA 95945, Telephone (530) 274-4373. A non-refundable fee of thirty-five dollars ($35.00) per bid set will be charged if picked up, or forty ($40.00) per bid set if mailed. Alternatively, bidders may download an electronic copy of the bid set free of charge from the City’s website at http://www.cityofgrassvalley.com/departments/engineering/rfpsrfqs-and-current-bids

The City reserves the right, during the bid process and prior to the deadline for submitting bids, to issue one or more addenda, clarifications, or other communication concerning the bid process, including possible changes as to the time, place, and manner for submitting bids. The City will provide this information to any potential bidder who has obtained a bid package directly from the City. The City will also provide notice of the availability of revisions/addenda to any potential bidder who has obtained a bid package electronically from a contractor bid room or other source, if that bidder has provided the following written statement to the City:

- A Request for Revisions, including the bidder's name, company, mailing address, phone number, fax number, email and project name that the bidder is requesting notifications for, shall be submitted as soon as possible, but no later than five (5) business days prior to the date specified for opening bids. The statement shall be hand-delivered or sent by US mail, with return receipt requested, to the attention of Timothy Kiser, Public Works Director/City Engineer, City of Grass Valley, Engineering Division, 125 East Main Street, Grass Valley, CA 95945.

Bidders who do not purchase bid documents directly from the City of Grass Valley, but who have requested to receive revisions as described above, shall only receive email and/or fax notices of the availability of revisions/addenda. It shall be the bidder’s responsibility to access the actual revisions/addenda as electronic copies from the City's website.

The City will also endeavor to provide such revisions/addenda to any contractor bid room which has requested copies of the underlying Request for Bids. The City takes no responsibility for notifying a bidder who does not obtain bid documents from the City or does not provide the specified notice to the City. Such bidder may be found non-responsive if that bidder fails to acknowledge, as set forth herein, any addenda or does not take into account any additional information provided by the City.

All questions concerning this project shall be provided in writing as soon as reasonably possible, but no later than five (5) working days before the date specified for opening bids. Questions received less than five (5) working days before the date specified for opening bids may not be answered. All questions must be received by the City, in the manner described below.

Faxes: To the attention of the Project Manager, at (530) 274-4399.
Mailed: To the attention of the Project Manager

City of Grass Valley
Engineering Division
125 East Main Street
Grass Valley, CA 95945

Bidders are responsible to confirm receipt of written questions by the Engineering Division. Additionally, the City will answer a bidder’s question only if the bidder provides the City a means for a response, including a telephone number, address, and fax number. Bid Bonds shall be required for this project. The successful bidder shall be required to furnish a Payment Bond and a Performance Bond and certificates of liability and property damage insurance. The amounts of liability and
property damage insurance will not be less than the amounts shown in the Contract and shall also include the endorsements specified.

Bidders are urged to obtain DBE participation on this project, although there are no specific goals for DBE participation.

The City of Grass Valley hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Pursuant to Section 1773 of the Labor Code, the general prevailing rate of wages for Nevada County have been determined by the Director of the California Department of Industrial Relations (DIR). These wages are set forth in the General Prevailing Wage Rates for this project, may be examined at the office of the Engineering Division, City of Grass Valley and are available from the California Department of Industrial Relations’ Internet web site at http://www.dir.ca.gov/DLSR/PWD. The Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished will apply to work done under this Contract.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

Dated: February 26, 2015

TIMOTHY M. KISER, PUBLIC WORKS DIRECTOR/CITY ENGINEER
CITY OF GRASS VALLEY
ENGINEERING DIVISION
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INSTRUCTIONS TO BIDDERS

1. BIDDER’S REPRESENTATIONS

Each bidder by submitting a bid represents that:

1.1. The bidder has read and understands the bid package and the bid is in accordance with all of the requirements of the bid package and applicable law.

1.2. Neither the bidder nor any subcontractor included on the list of proposed subcontractors submitted with the bid are ineligible to perform work on public works projects pursuant to California Labor Code Sections 1777.1 or 1777.7.

1.3. The bidder understands that quantities of unit price items may vary from the estimates provided in the Special Provisions, proposal, technical specifications, and construction contract.

1.4. Representatives of the bidder have visited the Project site and have familiarized themselves with the conditions under which the Project work is to be performed to ensure that the Project work may be performed for the amount bid.

1.5. The bidder has informed the City in writing no later than five (5) working days prior to the time specified for bid opening of any apparent conflicts, errors, or ambiguities contained in the bid package or between the contents of the bid package and the Project site.

2. PRE-BID COMMUNICATION AND INTERPRETATION OF THE BID PACKAGE

2.1. Any bidder that discovers any apparent conflicts, errors, or ambiguities contained in the bid package or between the contents of the bid package and the Project site, or that has questions or requires clarification concerning the bid package or its intent must inform the City in writing as soon as reasonably possible, but no later than five (5) working days before the date specified in the bid opening. Such notice shall be sent as specified in the Notice to Contractors for questions concerning the bid package. Questions received less than five (5) working days before the time specified for opening bids may not be answered.

2.2. Any interpretation, correction or change of the bid package prior to bid opening will be made by addendum signed by the City Engineer and transmitted to all bid package recipients. No other interpretation or information concerning the bid package issued prior to the date specified for opening bids will be binding. All addenda signed by the City Engineer and issued prior to the time and date specified for opening bids will form a part of the contract documents and must be acknowledged on the bid forms. Any changes, exceptions or conditions concerning the Project and/or the bid package submitted by any bidder as part of a bid may render that bid non-responsive.

2.3. The City takes no responsibility for notifying a bidder who does not obtain bid documents from the City or does not provide the specified Request for Revisions statement to the City. Such bidder may be found non-responsive if that bidder fails to acknowledge, as set forth herein, any addenda or does not take into account any additional information provided by the City.

2.4. No other interpretation or information concerning the bid package issued prior to the date specified for opening bids will be binding. All addenda signed by the City Engineer and issued prior to the time and date specified for opening bids will form a part of the contract documents and must be acknowledged on the bid forms. Any
changes, exceptions or conditions concerning the Project and/or the bid package submitted by any bidder as part of a bid may render that bid non-responsive.

3. **PRE-BID ACCESS TO THE SITE**

   3.1. Prior to submitting a bid, it will be the sole responsibility of each bidder to conduct any additional examination, investigation, exploration, test, study or other inquiry and to obtain any additional information pertaining to the physical conditions (including surface, subsurface, and underground utilities) at or near the Project site that may affect the cost, progress, or performance of the Project, and that the bidder deems necessary to prepare its bid for performance of the Project in accordance with the bid package and contract documents. Bidders seeking any such additional examination or other inquiries or information concerning the Project will do so at the bidder’s sole expense.

   3.2. Bidders seeking to conduct any additional examination or other inquiry at the Project site must request site access from the City at least two (2) working days in advance. The location of any excavation, boring or other invasive testing will be subject to approval on behalf of the City and any other agencies with jurisdiction over such testing. Bidders may not conduct tests at the Project site prior to obtaining City approval. The City may require bidders to execute an access agreement or encroachment permit prior to approving testing at the Project site. Once approved testing is complete, bidders shall fill all trenches or holes, restore all pavements to match the existing structural section, and otherwise clean up and restore the test site to its pre-test condition solely at the bidder’s expense.

   3.3. The Bidder’s attention is directed to the requirements of Section 2-1.30, “Job Site and Documentation Examination,” of the Construction Specifications and these Special Provisions.

4. **BIDDING PROCEDURE**

   4.1. Bids shall be delivered to the City of Grass Valley, Engineering Division, 125 East Main Street, Grass Valley, CA 95945, no later than the time and date specified in the Notice to Contractors. Bids will be opened and read publicly at that time. Bids that are submitted late according to the time shown on the official bid clock located in City Hall will be returned unopened. Telephones for use by bidders are not available at the City offices.

   4.2. In accordance with California Public Contract Code Section 20170, bids must be presented under sealed cover. Bids must be submitted using the proposal forms furnished with the bid package. Bids must include all documents provided in the Proposal. Bids must bear the bidder’s legal name and be signed by a representative authorized to bind the bidder. Bids shall be typed or written in ink. Corrections may be made if initialed by the bidder. No oral or telegraphic modifications of bids, including facsimile modifications, will be considered. Bids that are incomplete or that are not presented on the proposal forms furnished with the bid package may be deemed non-responsive.

   4.3. Each bid must give the full business address of the bidder. Bids of partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership, or by an authorized representative, followed by the printed name and title of the person signing. Bids of corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the president, secretary or other person authorized to bind the corporation. The name of each person signing shall also be typed or printed below the signature. Upon request of the City, bidders will furnish satisfactory evidence of the authority of the person signing the bid. Bids of joint ventures must include a certified copy of the legal agreement constituting the joint venture.

   4.4. No person, firm, corporation, partnership, or legal joint venture may submit more than one bid for the Project. However, a person, firm, corporation, partnership or legal joint venture that has submitted a subcontract proposal to a bidder, or that has quoted prices on materials to a bidder may submit a subcontract proposal, quote prices to other bidders and submit its own bid.

   4.5. In accordance with California Public Contract Code Section 20171, all bids must include one of the forms of security specified in the Notice to Contractors in an amount of at least ten (10) percent of the total of the bid prices. Bidders that elect to provide bidder’s security in the form of a bid bond must execute a bid bond using the form provided in the bid forms. The bidder’s security is tendered as a guarantee that the successful bidder, if awarded the Project contract, will execute and submit to the City all required bonds, certificates of insurance, and completed contract forms and enter into a contract with the City within ten (10) working days of receipt of the
Notice of Award. The bidder’s security of any successful bidder that fails to do so will be forfeited to the City. All bidders’ security not forfeited to the City will be returned once a successful bidder provides all required documents and enters a contract with the City in accordance with all applicable bid package requirements. Forfeiture of the bidder’s security to the City will not waive or otherwise limit any other remedy available to the City under applicable law.

4.6. In accordance with California Business and Professions Code Section 7028.15, Public Contract Code Section 20103.5, and as specified in the Notice to Contractors, all Project work must be performed by properly licensed contractors and subcontractors with active licenses in good standing as of the date and time specified for bid opening, or, if the Project involves federal funds, no later than the time the Project contract is awarded. Bidders must verify their Contractor’s license number and license expiration date on the proposal cover page under penalty of perjury. Bids that do not satisfy applicable licensing requirements will be considered non-responsive and rejected and may subject the bidder to criminal and/or civil penalties. In addition, all licenses shall remain in effect throughout the term of the contract.

4.7. Bids may be withdrawn prior to the time set for bid opening by a written request signed by an authorized representative of the bidder filed with the Public Works Director/City Engineer. The bid security submitted with bids so withdrawn will be returned to the bidder. Bidders that have withdrawn their bid in accordance with this provision may submit a new bid prior to the time set for bid opening in accordance with all applicable bid package requirements. Bids may not be withdrawn during the ninety-day period after the time set for bid opening except as permitted by law pursuant to California Public Contract Code Section 5100 and following. Any other bid withdrawal will result in forfeiture of the bidder’s bid security to the City.

4.8. In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professional Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment to the parties.

5. BID PROTESTS

Any protest of the proposed Project award must be submitted in writing to the City no later than 5:00 PM on the third business day following the date of the bid opening.

5.1. The initial protest must contain a complete statement of the basis for the protest.

5.2. The protest must state the facts and refer to the specific portion of the document or the specific statute that forms the basis for the protest. The protest must include the name, address, and telephone number of the person representing the protesting party.

5.3. The party filing the protest must concurrently transmit a copy of the initial protest to the apparent low bidder.

5.4. The party filing the protest must have actually submitted a bid for the Project. A subcontractor of a party filing a bid for the Project may not submit a bid protest. A party may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.

5.5. The procedure and time limits set forth in these Instructions to Bidders are mandatory and are the bidders’ sole and exclusive remedy in the event of a bid protest. Any bidder’s failure to fully comply with these procedures shall constitute a waiver of any right to further pursue a bid protest, including filing of a challenge of the award pursuant to the California Public Contract Code, filing of a claim pursuant to the California Government Code, or filing of any other legal proceedings.

5.6. The City shall review all timely protests prior to award of the Project. The City shall not be required to hold an administrative hearing to consider any protests, but may do so at its option. At the time of the City Council’s consideration of the Project award, the City Council shall also consider the merits of any timely protests. The City Council may either reject the protest and award to the lowest responsible bidder or accept the protest and award
6. **AWARD**

6.1. The bidder’s attention is directed to the provisions in Section 3, “Contract Award and Execution”, and Section 4, “Beginning of Work, Time of Completion and Liquidated Damages,” of these Special Provisions.

6.2. In accordance with applicable law, the City reserves the right to reject any or all bids and to waive any informality in any bid. The City reserves the right to accept any portion of any bid, unless the bid package expressly provides that the award will be made as a whole. If the City elects to award a contract for performance of the Project, the contract will be awarded in accordance with California Public Contract Code Section 20162 and other applicable law to the responsible bidder submitting a responsive bid with the lowest total bid price for the base bid and those additive or deductive alternate items listed in the Proposal. In accordance with the contract documents and other applicable law, the City may add or deduct items of work from the Project after the lowest responsible bidder is determined.

6.3. The contract shall be awarded, if an award is made, to the lowest responsible bidder within 90 calendar days from the date bids are publicly opened and declared. If the award is not made within that period, all bids submitted are deemed rejected by the governing body.

A contract shall exist between the Contractor and the City when all of the following steps have been completed.

(a) Award of the contract by the governing body.

(b) Execution of a written contract by the Contractor within ten (10) working days of receipt of written notice of award.

(c) Delivery by the Contractor to the City, the Faithful Performance and Labor and Materials bonds required herein, within ten (10) working days of receipt of written notice of award.

(d) Delivery by the Contractor to the City, all City-approved Insurance Policies, on the appropriate forms, as required, within ten (10) working days of receipt of written notice of award.

Contractor shall execute a written agreement with the City using the form set forth hereafter.

6.4. The successful bidder and any subcontractors and others engaged in performance of the Project shall have valid local business licenses, as applicable, before commencing work on the Project.

6.5. Upon verifying that the successful bidder has provided complete, executed copies of all documents specified necessary to execute the contract and an authorized City representative has signed the contract, the Engineering Division will issue a Notice to Proceed in accordance with Section 4, “Beginning of Work, Time of Completion and Liquidated Damages,” of these Special Provisions. The number of days within which the Project must be complete begins to run on the project commencement date.

7. **PRICING**

7.1. Inconsistency of bid unit items, item prices, and/or totals shall be resolved in accordance with the requirements specified in the Proposal.

7.2. Any federal, state, or local tax payable on articles to be furnished for the Project shall be included in the lump sum total bid price and paid by the Contractor under the contract.

8. **QUANTITIES**

8.1. Quantities, including but not limited to, material or labor quantities, that are provided in the bid package concerning the Project are estimates only and are provided solely as a general indication of the Project scope. The City does not warrant that such quantity estimates provided in the bid package represent the actual quantities required to perform the Project in accordance with the contract documents. Such quantity estimates do not bind the
City and bidders should not rely on them in preparing their bids. Each bidder is solely responsible for determining the quantities on which to base their bids in light of information contained in the bid package, bidder investigation and analysis of the Project and the Project site, and any other analysis or expertise of the bidder concerning the Project.

8.2. The City may amend, decrease or increase the Project work in accordance with the bidding package and the contract documents. If the City amends, decreases or increases the Project work prior to award of the Project, each bidder will be solely responsible for determining the revised quantities, if any, on which to base their bid in light of information contained in the bid package and any amendments or addenda to the bid package, bidder investigation and analysis of the Project as amended, decreased or increased, the Project site, and any other analysis or expertise of the bidder concerning the Project.

9. **SUBSTITUTION OF “OR EQUAL” ITEMS**

9.1. In accordance with California Public Contract Code Section 3400 concerning the submittal of an “or Equal” product, bidder’s attention is directed to the requirements of Section 2-1.02, “Required Listing of Proposed Products “or Equals” with Bid Proposal” of these Special Provisions, and the Proposal.

10. **SUBCONTRACTING**

10.1. Bids must be in accordance with the requirements of the Subletting and Subcontracting Fair Practices Act, California Public Contract Code Section 4100 and the following. Bids must include a completed list of proposed subcontractors on the form included in the bid package. In accordance with California Public Contract Code Section 4104, completed lists of proposed subcontractors must include the name, business location, the portion (type or trade), and dollar amount of the Project work to be subcontracted for each subcontractor that will perform a portion of the Project work (including special fabrication and installation of a portion of the work) valued in excess of one half on one percent of the total Project bid price. If the Project work includes construction of streets or highways, the completed list of proposed subcontractors must include the subcontractor name, business location, type of work and dollar amount to be subcontracted for each subcontractor that will perform a portion of the Project work (including special fabrications and installation of a portion of the work) valued in excess of one half of one percent of the total Project bid price, or one thousand dollars ($1,000), whichever is greater.

10.2. In accordance with California Public Contract Code Section 4106, for any portion of the Project work with a value of more than one half of one percent of the total Project bid price for which no subcontractor is listed, or for which more than one subcontractor is listed, bidders certify by submitting their bids that they are qualified to perform that portion of the Project work and that they will perform that portion of the Project work with their own forces. Bidders may not substitute another subcontractor for a subcontractor listed in their bid except as permitted by the City in accordance with Section 4107 and following of the California Public Contract Code.

10.3. Bidder’s attention is directed to the requirements specified in “Subcontracting,” of these Special Provisions and the Proposal.

11. **ASSIGNMENT**

11.1. Bidders may not assign, sublet, sell, transfer, or otherwise dispose of their bid or any right, title or interest in their bid, or their obligations under their bid, without the written consent of the Public Works Director/City Engineer. Any purported assignment, subletting, sale, transfer or other disposition of a bid or any interest in a bid, or of any obligations under a bid without such written consent will be void and of no effect.

11.2. Bidder’s attention is directed to the requirements specified in Section 5-1.12, “Assignment,” of the Construction Specifications.

12. **BONDS**

12.1. The successful bidder shall submit to the City a performance bond within ten (10) working days of receiving written notice of award. The successful bidder shall submit to the City a payment or labor and materials bond within ten (10) working days of receiving written notice of award. City shall retain the Performance Bond for a one-year guarantee period from the date of the City’s acceptance of the work. All Project bonds shall be executed using the forms provided in the bid package.
12.2. The bonds shall be obtained from a California admitted surety that is licensed by the State of California to act as a surety upon bonds and undertakings and which maintains in this State at least one office for the conduct of its business. The surety shall furnish reports as to its financial condition from time to time upon request by City.

12.3. In accordance with California Civil Code Section 3247, labor and materials bond must be in the amount of one hundred percent of the total amount payable by the terms of the Project contract and guarantee payment to persons listed in California Civil Code Section 3181 for work performed and for charges for materials, supplies, and equipment provided under the Project contract (including amounts due under or subject to the Unemployment Insurance Code) in accordance with the requirements of California Civil Code Section 3248.

12.4. The performance bond must be in the amount of one hundred percent of the amount payable by the terms of the Project contract to guarantee the faithful performance of the Project work.

12.5. Bidder’s attention is directed to the requirements specified in Section 3-1.05, “Contract Bonds,” and “Warranty,” of these Special Provisions, and the Contract.

13. LABOR LAWS


13.2. In accordance with California Labor Code Section 1771, not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Project is to be performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed as provided in the California Labor Code shall be paid to all workers engaged in performing the Project.

13.3. In accordance with California Labor Code Section 1770 and following, the Director of Industrial Relations has determined the general prevailing wage per diem rates for work in the locality in which the Project is to be performed. In accordance with California Labor Code Section 1773, the City has obtained the general prevailing rate of per diem wages and the general rate for holiday and overtime work in the locality in which the Project is to be performed for each craft, classification or type of worker needed to perform the Project. In accordance with California Labor Code Section 1773.2, copies of the prevailing rate of per diem wages for Nevada County are on file at the City offices, 125 E. Main Street, Grass Valley, California 95945. These wage rates are not included in the Special Provisions but will be made available on request.

13.4. In accordance with California Labor Code Section 1777.1, contractors and subcontractors that are found guilty of willfully violating Chapter 1 of Part 7 of Division 2 of the Labor Code (except for Section 1777.5), or that are found guilty of such violations with intent to defraud, and entities in which such contractors or subcontractors have any interest, may be ineligible to bid on, be awarded, or perform Project work as a subcontractor.

13.5. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

SECTION 1. SPECIFICATIONS AND PLANS

3-1.01 GENERAL

The work embraced herein shall be done in accordance with the Project Plans, Standard Specifications and Standard Plans dated 2010 of the Department of Transportation, and the City of Grass Valley’s Improvement Standards and in accordance with the following Special Provisions.

Amendments to the Department of Transportation’s Standard Specifications set forth in these Special Provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.02, “Contract Components” of the Standard Specifications and are included as Attachment A to these Special Provisions. Whenever either the term “Standard Specification is amended” or the term “Standard Specifications are amended” is used in the Special Provisions, the text following said term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

In case of conflict between the City of Grass Valley’s Improvement Standards, and these Special Provisions, the Special Provisions shall govern, take precedence over, and be used in lieu of such conflicting portions. The Department of Transportation’s Standard Specifications and Standard Plans shall govern over the City of Grass Valley’s Improvement Standards.

Units in the United States Standard Measures shall apply to this contract.

3-1.02 DEFINITIONS AND TERMS

As used herein, unless the context otherwise requires, the following terms have the following meaning:

City: City of Grass Valley.

City Engineer: The Public Works Director/City Engineer of the City of Grass Valley, State of California.

City Hall: The City building located at 125 East Main Street, Grass Valley, California, 95945.

Contract Documents: All of the written matter describing the contemplated work, including the Plans, Special Provisions, Improvement Standards, Bonds, Agreement, and any approved Change Orders.

Department: The Engineering Department of the City of Grass Valley, State of California, except when referring to documents, laws or departments of the State of California. Any reference in question shall be as designated by the Engineer.

Department of Transportation: The Engineering Division of the City of Grass Valley, State of California, except when referring to documents, laws or departments of the State of California. Any reference in questions shall be as designated by the Engineer.

Director of Transportation: The Public Works Director/City Engineer of the City of Grass Valley, State of California.

District Director of the District: The Public Works Director/City Engineer of the City of Grass Valley, State of California.

Engineer: The Public Works Director/City Engineer of the City of Grass Valley, State of California, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Improvement Standards: The Design Standards, Construction Standards and Standard Details of the City of Grass Valley Public Works Department, Engineering Division

Laboratory: The established laboratory of the Materials and Research Department of the Department of Transportation of the State of California or laboratories authorized by the Engineer to test materials and work involved in the Contract, except when referring to documents, laws or departments of the State of California. Any reference in question shall be as designated by the Engineer

Standard Plans: The 2010 edition of the Standard Plans of the State of California, Department of Transportation. Any reference therein to the State of California or a State agency, office, or officer shall be interpreted to refer to the City or it's corresponding agency, office, or officer acting under this contract.
Standard Specifications: The 2010 edition of the Standard Specifications of the State of California, Department of Transportation. Any reference therein to the State of California or a State agency, office, or officer shall be interpreted to refer to the City or its corresponding agency, office, or officer acting under this contract.

State: The City of Grass Valley, except when referring to documents, laws or departments of the State of California. Any reference in question shall be as designated by the Engineer.

State Highway Engineer: The Public Works Director/City Engineer of the City of Grass Valley, State of California, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Transportation Building, Sacramento: City Hall of the City of Grass Valley, State of California except when referring to documents, laws or departments of the State of California. Any reference in question shall be as designated by the Engineer.

Working Day: Monday through Friday, except holidays, from 7am to 7pm, or as further specified in these Special Provisions.

Contractor’s attention is directed to the definitions and terms specified in Section 1, “Purpose and Definitions,” of the Design Standards and Section 1, “Purpose and Definitions,” of the Construction Standards.

SECTION 2. BIDDING

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Bidding," of the Standard Specifications and these Special Provisions for the requirements and conditions which the bidder must observe in the preparation of the proposal form and the submission of the bid.

Each proposal shall include unit costs, and total costs for the base bid.

Bidders are required to specify a physical business street address to receive certified mail in accordance with the Proposal. The City shall be notified in writing a minimum of thirty (30) days in advance of any changes of address.

Section 2-1.06A, “General,” of the Standard Specifications is replaced in its entirety with the following:

Improvement Standards may be viewed at the City of Grass Valley’s website: http://www.cityofgrassvalley.com/services/departments/engineering/standard_specifications_and_drawings.php

The Notice to Contractors, Special Provisions, and Construction Contract, Proposal and Bidder's Certificates and Improvement Plans may be viewed at the City of Grass Valley website, http://www.cityofgrassvalley.com/services/departments/engineering/overview.php, or at City Hall at 125 East Main Street, Grass Valley, CA 95945. The Proposal form is bound separate from the Contract and the Special Provisions.

In addition to the subcontractors required to be listed in conformance with, “Required Listing of Proposed Subcontractor,” of these Special Provision, each proposal shall have listed therein the portion of work that will be done by each subcontractor listed. Each Proposal shall have listed therein the name and address of each DBE subcontractor to be used for credit in meeting the goals and to whom the bidder proposes to directly subcontract portion of the work. The listing subcontractor shall also set forth the portion of work that will be done by each subcontractor listed. A sheet for listing the subcontractors is included in the Proposal.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of Department of Transportation assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, including but not limited to escrowed bid documents, where applicable, may subject the bidder to a determination of the bidder’s responsibility in the event it is the apparent low bidder on any future public works contracts.
2-1.02 REQUIRED LISTING OF PROPOSED PRODUCTS “OR EQUALS”

On the sheet provided herein, to be submitted as part of the proposal, the bidder shall list each proposed substitution of an “equal” product. The bidder shall identify the proposed substitution by the section of the specifications that specifies the product, the name of the product proposed to be substituted out, and the name and manufacturer of the product proposed to be substituted. Prior to the award of the Contract and upon the request of the Engineer, the bidder shall submit the written request for substitution within three (3) days. The request shall be accompanied by evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the bidder. Failure to submit the information as requested by the Engineer shall be deemed a voluntary withdrawal of the proposed substitution.

No requests for any substitution shall be allowed unless listed on the sheet provided. No requests for substitution shall be allowed after the opening of the bid. Requests for substitution shall be reviewed and considered by the Engineer promptly after the award of the contract to the lowest responsible Bidder. In its sole discretion, the Engineer may request additional information about the proposed substitution.

The decision by the Engineer as to whether a proposed substitution is an “Equal” product shall be made by the Engineer based upon the information submitted and will be final.

The Engineer will be the sole judge as to whether a proposed substitution is an “Equal” product. The Engineer’s decision will be made based upon the information submitted and will be final.

A sheet for listing the proposed substitutions of an “Equal” product, as required herein, is included in the Proposal.

2-1.03 SUBCONTRACTOR LIST

Contractor’s attention is directed to the requirements of Section 2-1.33C, “Subcontractor List” of the Standard Specifications, the Proposal, and these Special Provisions.

In addition to the Subcontractors required to be listed, each proposal shall have listed herein the name and address, and license designation number of each Subcontractor to whom the bidders proposes to directly subcontract portions of the work. The list of Subcontractors shall also set forth the portion of work that will be done by each Subcontractor listed.

A sheet for listing the subcontractors, as required herein, is included in the Proposal.

2-1.04 BIDDER’S SECURITY

The form of Bidder’s Bond mentioned in Section 2-1.34, “Bidder’s Security,” of the Standard Specifications will be found following the signature page of the Proposal annexed hereto.

2-1.05 NON-COLLUSION AFFIDAVIT

In accordance with Public Contract Code 7106, a Non-Collusion Affidavit is included in the proposal.

2-1.06 DISADVANTAGE BUSINESS ENTERPRISES (DBE)

The City maintains a goal that Disadvantaged Business Enterprises (DBEs), as defined in Part 26, Title 49 CFR, shall be encouraged to participate in the performance of City contracts. The Contractor should ensure that DBEs, as defined in Part 26, Title 49 CFR, have the opportunity to participate in the performance of this contract and shall take all necessary and reasonable steps, as set forth in Part 26, Title 49 CFR, for this assurance. The Contractor shall not discriminate on the basis of race, color, national origin, or gender in the award and performance of subcontracts. Failure to carry out the requirements of this paragraph shall constitute a breach of contract and may result in termination of this contract or other remedy the City may deem appropriate.

Bidders shall be fully informed respecting the requirements of the Code of Federal Regulations and are urged to obtain DBE participation in this project.

Caltrans has engaged the services of a contractor to provide supportive services to contractors and subcontractors to assist in obtaining DBE participation on federally funded construction projects. Bidders and potential subcontractors should check the Caltrans website at http://www.dot.ca.gov/hq/bep to verify the current availability of this service.

SECTION 3. CONTRACT AWARD AND EXECUTION

3-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 3, "Contract Award and Execution," of the Standard Specifications, “Award,” of the Instruction To Bidders of these Special Provisions, and these Special Provisions for the requirements and conditions concerning submittal of DBE information, award, and execution of contract.

Bid protests are to be delivered to the following address. Engineering Division, 125 East Main Street, Grass Valley, CA 95945.
The award of the contract, if it be awarded, will be to the lowest responsible bidder whose bid complies with all the requirements prescribed.

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

The contract shall be executed by the successful bidder and shall be returned together with the contract bonds, to the Agency so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Engineering Division, 125 East Main Street, Grass Valley, CA 95945.

3-1.02 AWARD OF CONTRACT

Section 3-1.01 of the Standard Specifications is amended to read:

3-1.01 Award of Contract – The City of Grass Valley reserves the right to reject any and all bids or to waive any minor defects or irregularity in bidding in accordance with applicable law. In accordance with California Public Contract Code Section 20103.8, if the City elects to award a contract for performance of the project, the contract will be awarded in accordance with California Public Contract Code Section 20162 and other applicable law to the responsible bidder submitting a responsive bid with the lowest total bid price for the base bid without consideration of the bid price for any additive or deductive items. All bids will remain valid for 90 days after the bid opening. Except as permitted by law and subject to all applicable remedies, including forfeiture of bidder’s security, bidders may not withdraw their bid during the 90 day period after the bid opening.

3-1.03 CONTRACT BONDS

Contractor shall provide, at the time of the execution of the agreement or contract for work, and at his own expense, a surety bond (“Performance Bond”) in an amount equal to at least 100 percent (100%) of the contract price as security for the faithful performance of said agreement within the time prescribed, in a manner satisfactory to the Engineer, and that all materials and workmanship will be free from original or developed defects. This Performance Bond must remain in effect until the end of all warranty periods set forth in the Special Provisions. Contractor shall also provide, at the time of the execution of the agreement or contract for the work, and at his own expense, a separate surety bond (“Payment Bond”) in an amount equal to at least 100 percent (100%) of the contract price as security for the payment of all persons performing labor and furnishing materials in connection with said agreement. This Payment Bond shall be maintained by the Contractor in full force and effect until the work is accepted by the City and until all claims for materials and labor are paid, and shall otherwise comply with Civil Code. Sureties on each of said bonds shall be satisfactory to the City Attorney.

Should any bond become insufficient, the Contractor shall renew the bond within ten (10) working days after receiving notice from the Engineer.

Should any Surety at any time be unsatisfactory to the City, notice will be given the Contractor to that effect. No further payments shall be deemed due or will be made under said agreement until a new Surety shall qualify and be accepted by the City.

Changes in said agreement of extensions of time, made pursuant to the agreement, shall in no way release the Contractor or Surety from its obligations. Notice of such changes or extensions shall be waived by the Surety.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION, AND LIQUIDATED DAMAGES

4-1.01 GENERAL

Attention is directed to the provisions in Section 8-1.04, "Start of Job Site Activities," in Section 8-1.05, "Time," and in Section 8-1.10, "Liquidated Damages," of the Standard Specifications, and these Special Provisions.

The Contractor shall begin work by the date identified in writing in the Notice to Proceed by the City of Grass Valley and shall diligently prosecute the same before the expiration of

20 Working Days

Beginning on the first day of work or the date stated in the Notice to Proceed, whichever comes first.

Due to the project location involving critical segments of roadway and due to constraints of special events in the areas, time is of the essence to complete the contract work. Specifically, due to a scheduled, significant public event, work necessary to complete “Asphalt Concrete Structural Section Replacement” and “Minor Concrete (Stamped Crosswalk)” shall be completed no later than May 10, 2015
The Contractor shall pay to City of Grass Valley the sum of $500 per day, as liquidated damages, for each and every calendar day delay in finishing the work in excess of the working days prescribed above. At the Engineer’s option, said sum may be deducted from any payment due to or to become due the Contractor.

The 72 hours advance notice before beginning work specified in Section 8-1.04, "Start of Job Site Activities," of the Standard Specifications is changed to 5 days advance notice for this project.

4-1.02 HOLIDAYS

Designated legal holidays are: January 1st, the third Monday in January, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, the second Monday in October, November 11th, Thanksgiving Day, the day after Thanksgiving day and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When a designated legal holiday falls on a Saturday, the preceding Friday shall be a designated legal holiday.

4-1.03 WINTERIZATION

The Contractor shall, at his sole expense, winterize the project if construction activities are not completed by October 15. The Contractor shall winterize the project in conformance with the requirements of “Water Pollution Control,” of these Special Provisions for all construction activities that take place between October 15th and May 1st. An acceptable winterization plan shall be submitted to the Engineer no later than October 1st for his review and acceptance.

The Contractor’s winterization plan is required for all construction activities that take place between October 15th and May 1st and shall be in conformance with the requirements of “Water Pollution Control,” of these Special Provisions.

The intent of winterization is as follows:

1. To assure that erosion of earthen materials is prevented to greatest extent practicable.
2. To assure that storm waters are allowed to pass through the site without substantial damage to the project site.

After the acceptance of a winterization plan and the installation of all required temporary winterization measures, work may proceed after October 15th, if approval is obtained in writing from the California Regional Water Quality Control Board and the Engineer. All work done after October 15th must be able to be winterized within 24 hour notice.

Winter Suspension: The City may, at its option, suspend work between October 15th and May 1st of the following year. If this occurs, the entire site shall be winterized including areas not yet seeded or planted.

Full compensation for conforming to the provisions of this section, not otherwise provided for in other sections of these Special Provisions, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

4-1.04 PRE-CONSTRUCTION CONFERENCE

A pre-construction conference will be held at the office of the City Engineer for the purpose of discussing with the Contractor the scope of work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution and the satisfactory completion of the project as required. The Contractor’s representative at this conference shall include all major superintendents for the work and may include major subcontractors. A “Key Personnel and Emergency Phone Numbers” list (for which these key personnel could be contacted 24 hours per day, 7 days a week) shall be submitted to the City. Attendance by the Contractor or the Contractor's authorized representative is mandatory.

Full compensation for conforming to the provisions of this section, not otherwise provided for in other sections of these Special Provisions, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

4-1.05 ARCHAEOLOGICAL FINDS

All articles of archaeological interest, which may be uncovered by the Contractor during the progress of the work, shall be reported immediately to the Engineer. The further operations of the Contractor, with respect to the find will be decided under the direction of the Engineer.

4-1.06 EXTRA WORK

Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications is amended by adding the following between the second and third paragraphs:
If in the opinion of the Engineer, such work cannot reasonably be performed concurrently with other items of work, and if a controlling item of work is delayed thereby, an adjustment of contract time will be made.

4-1.07 SCOPE OF WORK

Shall conform to the provisions of Section 4, "Scope of Work," of the Standard Specifications and these Special Provisions.

4-1.08 ELIMINATION OF ITEMS OF WORK

The Contractor’s attention is directed to Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications concerning the elimination of items of work, and these Special Provisions.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL COMPLY WITH CALIFORNIA LABOR CODE SECTIONS 1774 AND 1775, AND RELATED CODES.

5-1.01 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM
(GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.02I(2), "Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt State contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The specifications are applicable to all nonexempt State construction contracts and subcontracts of $5,000 or more.

5-1.02 LABOR CODE REQUIREMENTS

For all new projects awarded on or after April 1, 2015, the contractors and subcontractors must furnish electronic certified payroll records to the Labor Commissioner. After January 1, 2015, the requirement to furnish electronic certified payroll records to the Labor Commissioner will apply to all public works projects, whether new or ongoing.

Attention is directed to the provisions in Section 7-1.02K(5), "Working Hours" and Section 7-1.02K(3), "Certified Payroll Records" of the Standard Specifications.

5-1.03 PREVAILING WAGE

Attention is directed to the provisions in Section 7-1.02K(2), "Wages" of the Standard Specifications.

The general prevailing wage rates and any applicable changes to these wage rates determined by the Director of Industrial Relations for Nevada County, may be examined at the City of Grass Valley Engineering Division Office and are available from the California Department of Industrial Relations’ Internet web site at http://www.dir.ca.gov/DLSR/PWD. These wage rates are not included in the Proposal and Construction Contract for the project. Changes, if any, to the general prevailing wage rates will be available at the same location.

The general prevailing wage rates and any applicable changes to these wage rates determined by the United States Department of Labor, Branch of Construction Wage Determinations, for Nevada County, are available at the City of Grass Valley Engineering Division Office located at 125 East Main Street, Grass Valley, CA 95945 [telephone (530) 274-4373]. Changes, if any, to the general prevailing wage rates will be available at the same location. General prevailing wage rates area also available on the California Department of Transportation website: http://www.dot.ca.gov/hq/esc/oe/federal-wages/.

The Contractor and any subcontractor shall pay each worker that is employed for any public work done under contract, not less than the higher of the prevailing wage rates as determined by the California Director of Industrial Relations and the United States Department of Labor, Branch of Construction Wage Determinations.
5-1.04 SUBCONTRACTING

Attention is directed to the provisions in Section 5-1.13, "Subcontracting," of the Standard Specifications and these Special Provisions.

All subcontractors doing work shall possess an appropriate valid California Contractor’s License for the type of work the subcontractor will perform at the time of the bid submittal and the license shall remain in effect throughout the duration of employment on the job.

All applicable license designations and numbers for Subcontractors doing work in excess of $1,000.00 shall be included on the LIST OF SUBCONTRACTORS within the Proposal.

No subcontract releases the Contractor from the contract or relieves the Contractor of their responsibility for a subcontractor’s work.

If the Contractor violates Pub Cont Code § 4100 et seq., the City of Grass Valley may exercise the remedies provided under Pub Cont Code § 4110. The City of Grass Valley may refer the violation to the Contractors State License Board as provided under Pub Cont Code § 4111.

The Contractor shall perform work equaling at least 30 percent of the value of the original total bid with the Contractor’s own employees and equipment, owned or rented, with or without operators.

Each subcontract must comply with the contract.
Submit copies of subcontracts upon request by the Engineer.
Before subcontracted work starts, submit a Subcontracting Request form.

Pursuant to the provisions in Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at: http://www.dir.ca.gov/DLSE/Debar.html

Upon request by the Engineer, immediately remove and not again use a subcontractor who fails to prosecute the work satisfactorily.

5-1.05 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code concerning prompt payment to subcontractors. A prime contractor or subcontractor shall pay any subcontractor not later than 10 days of receipt of each progress payment in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The 10 days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over 30 days may take place only for good cause and with the agency’s prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanctions and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor or subcontractor performance.

5-1.06 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

No retainage will be held by the agency from progress payments due the prime contractor. Any retainage kept by the prime contractor or by a subcontractor must be paid in full to the earning subcontractor in 30 days after the subcontractor’s work is satisfactorily completed. Any delay or postponement of payment may take place only for good cause and with the agency’s prior written approval. Any violation of these provisions shall subject the violating contractor or subcontractor to the penalties, sanctions, and remedies specified in Section 7108.5 of the California Business and Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the contractor, deficient subcontractor performance.

5-1.07 PAYMENTS


5-1.08 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments, and claim payments shall be in accordance with Section 9-1.03, “Payment Scope,” of the Standard Specifications, the Standard Specifications, and these Special Provisions.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.
5-1.09 WITHHOLDS

Payment of withheld funds shall conform to Section 9-1.16E, "Withholds," of the Standard Specifications and these Special Provisions.

Funds withheld from progress payments to ensure performance of the contract that are eligible for payment into escrow or to an escrow agent pursuant to Section 10263 of the California Public Contract Code do not include funds withheld or deducted from payment due to failure of the Contractor to fulfill a contract requirement.

5-1.10 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Division of Structure Design, the drawings shall be submitted to the Engineer, unless otherwise specifically noted.

5-1.11 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

The third through seventh paragraph of Section 2-1.06B, "Supplemental Project Information," of the Standard Specifications is amended to read:

Where the Department has made investigations of site conditions, including subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources, bidders or Contractors may, upon written request, inspect the records of the Department as to those investigations subject to and upon the conditions hereinafter set forth.

Attention is directed to "Differing Site Conditions" of these Special Provisions regarding physical conditions at the site which may differ from those indicated in "Materials Information," log of test borings or other geotechnical information obtained by the Department's investigation of site conditions.

5-1.12 DIFFERING SITE CONDITIONS

Attention is directed to Section 4-1.06, "Differing Site Conditions," of the Standard Specifications.

During the progress of the work, if subsurface or latent conditions are encountered at the site differing materially from those indicated in the "Materials Information," log of test borings, other geotechnical data obtained by the Department's investigation of subsurface conditions, or an examination of the conditions above ground at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

The Contractor will be allowed 15 days from the notification of the Engineer's determination of whether or not an adjustment of the contract is warranted, in which to file a notice of potential claim in conformance with the provisions of Section 9-1.17D, "Final Payment and Claims," of the Standard Specifications and as specified herein; otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The notice of potential claim shall set forth in what respects the Contractor's position differs from the Engineer's determination and provide any additional information obtained by the Contractor, including but not limited to additional geotechnical data. The notice of potential claim shall be accompanied by the Contractor's certification that the following were made in preparation of the bid: a review of the contract, a review of the "Materials Information," a review of the log of test borings and other records of geotechnical data to the extent they were made available to bidders prior to the opening of bids, and an examination of the conditions above ground at the site. A copy of the geotechnical information for this project will be made available for review at City of Grass Valley Engineering Division Office located at 125 East Main Street, Grass Valley, CA. Supplementary information, obtained by the Contractor subsequent to the filing of the notice of potential claim, shall be submitted to the Engineer in an expeditious manner.

5-1.13 VALUE ENGINEERING

Attention is directed to Section 4-1.07, "Value Engineering," of the Standard Specifications.

Prior to preparing a written value engineering change proposal, the Contractor shall request a meeting with the Engineer to discuss the proposal in concept. Items of discussion will also include permit issues, impact on other projects, impact on the project schedule, peer reviews, overall merit of the proposal, and review times required by the City.

If a value engineering change proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in contract time, 50 percent of that contract time reduction shall be credited to the City by reducing the contract working days, not including plant establishment. Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages" of these Special Provisions regarding the working days.

If a value engineering change proposal submitted by the Contractor, and subsequently approved by the Engineer, provides for a reduction in traffic congestion or avoids traffic congestion during construction, 60 percent of the estimated net
savings in construction costs attributable to the cost reduction proposal will be paid to the Contractor. In addition to the requirements in Section 4-1.07, "Value Engineering," of the Standard Specifications, the Contractor shall provide detailed comparisons of the traffic handling between the existing contract and the proposed change, and estimates of the traffic volumes and congestion.

5-1.14 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.04, "Public Safety," of the Standard Specifications and these Special Provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

A. Excavations – The near edge of the excavation is 12 feet or less from the edge of the lane, except:
   1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
   2. Excavations less than one foot deep.
   3. Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot in diameter.
   4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
   5. Excavations in side slopes, where the slope is steeper than 4:1 (horizontal: vertical).
   6. Excavations protected by existing barrier or railing.

B. Temporarily Unprotected Permanent Obstacles – The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

C. Storage Areas – Material or equipment is stored within 12 feet of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these Special Provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.04, "Public Safety," of the Standard Specifications, shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one 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 shall 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 shall be installed at the approach end of the temporary railing.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Pre-qualified and Tested Signing and Delineation Materials," of these Special Provisions.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these Special Provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these Special Provisions:

<table>
<thead>
<tr>
<th>Approach Speed of Public Traffic (Posted Limit) (Miles Per Hour)</th>
<th>Work Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 45</td>
<td>Within 6 feet of a traffic lane but not on a traffic lane</td>
</tr>
<tr>
<td>35 to 45</td>
<td>Within 3 feet of a traffic lane but not on a traffic lane</td>
</tr>
</tbody>
</table>

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.
When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians facilities.

**Special Requirements:**

The Contractor attention is directed to "Special Requirements," of these Special Provisions. The Contractor shall notify the Police Department, Fire Departments, Ambulance Service, Schools, CHP, Caltrans, and the Engineer forty-eight (48) hours prior to any lane closure. Notification may be in conjunction with the scheduling requirements of the "Scheduling" portion of the Standard Specifications and these Special Provisions. The Contractor shall coordinate traffic control with the Sheriff's Department with respect to any special events that may be affected by construction activities. Particular attention shall be given to the construction of adequate facilities on any street to permit the passing of emergency vehicles.

In Lieu of conflicting with the provisions of Section 12-1.03, “Flagging Costs,” of the Standard Specifications, all flagging costs shall be included in the Traffic Control System bid items and no additional compensation will be allowed.

**Testing**

Testing of materials and work shall conform to the provisions in Section 6-3.05, "Quality Assurance," of the Standard Specifications and these Special Provisions.

Whenever the provisions of Section 6-3, "Quality," of the Standard Specifications refer to tests or testing, it shall mean tests to assure the quality and to determine the acceptability of the materials and work.

The Engineer will deduct the costs for testing of materials and work found to be unacceptable, as determined by the tests performed by the Department, and the costs for testing of material sources identified by the Contractor which are not used for the work, from moneys due or to become due to the Contractor. The amount deducted will be determined by the Engineer.

**Responsibility to Other Entities**

The Contractor shall be responsible for any liability imposed by law and for injuries to or death of any person including, but not limited to, workers and the public or damage to property, and shall indemnify and save harmless any county, city or district, its officers and employees connected with the work, within the limits of which county, city or district the work is being performed, all in the same manner and to the same extent conforming to the provisions in Section 7-1.05, "Indemnification," and Section 7-1.06, “Insurance,” of the Standard Specifications, for the protection of the State of California and all officers and employees thereof connected with the work.

**Areas for Contractor’s Use**

Attention is directed to the provisions in Section 5-1.32, "Areas for Use," of the Standard Specifications and these Special Provisions.

The project area (contract limits) shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

No area is available for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials, or for other purposes.

Residence trailers will not be allowed within the project site.

The Contractor shall remove equipment, materials, and rubbish from the work areas and other City-owned property which the Contractor occupies. The Contractor shall leave the areas in a presentable condition in conformance with the provisions in Section 4-1.13, "Final Cleaning Up," of the Standard Specifications.

The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials or for other purposes, if sufficient area is not available to the Contractor within the contract limits, or at the sites designated on the plans outside the contract limits.

The Contractor shall take all necessary precautions to protect the staging area from chemical contamination due to oil or fuel spills or any other contaminants. If contamination occurs, the site shall be decontaminated to the satisfaction of the Engineer prior to further improvement to the contaminated area or to further construction activities in general, whichever is applicable as determined by the Engineer. Methods of decontamination shall include any method deemed appropriate by the Engineer including removal and disposition of the contaminated soils in conformance with CEQA and regulatory agency requirements.
Full compensation for conforming to the provisions of this section, including furnishing all labor, materials, grading, tools, equipment and incidentals, and for doing all work associated with this section shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

5-1.18 SOUND CONTROL REQUIREMENTS

The noise level from the Contractor's operations, between the hours of 10:00 p.m. and 7:00 a.m., shall not exceed 55 dBA at a distance of 50 feet. This requirement shall not relieve the Contractor from responsibility for complying with local ordinances regulating noise level.

All equipment shall have sound-control devices no less effective than those provided on the original equipment. No equipment shall have an unmuffled exhaust. As directed by the Engineer, the Contractor shall implement the appropriate additional noise mitigation measures including, but not limited to, shutting off idling equipment, or additional notifications of adjacent residents than already specified in these Special Provisions.

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

5-1.19 PROJECT APPEARANCE

The Contractor shall maintain a neat appearance to the work and shall cleanup all tracked material and debris on a daily basis.

In areas visible to the public, the following shall apply:

A. Broken concrete and debris developed during clearing and grubbing shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed of weekly.

B. Mud, dirt, soil, and any debris resulted in trail from equipment and construction will be cleaned and cleared from the roadway and away from traffic daily.

C. The Contractor shall furnish trash bins for all debris from construction. All debris shall be placed in trash bins daily. Forms or falsework that are to be reused shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be reused are to be disposed of concurrently with their removal.

Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

5-1.20 RECORDS

The Contractor shall maintain cost accounting records for the contract pertaining to, and in such a manner as to provide a clear distinction between, the following six categories of costs of work during the life of the contract:

A. Direct costs of contract item work.

B. Direct costs of changes in character in conformance with Section 4-1.05B, "Work-Character Changes," of the Standard Specifications.

C. Direct costs of extra work in conformance with Section 4-1.05, "Changes and Extra Work," of the Standard Specifications.

D. Direct costs of work not required by the contract and performed for others.

E. Direct costs of work performed under a notice of potential claim in conformance with the provisions in Section 9-1.17D(2), "Claim Statement," of the Standard Specifications.

F. Indirect costs of overhead.

Cost accounting records shall include the information specified for extra work in Section 4-1.05, "Changes and Extra Work," of the Standard Specifications. The requirements for furnishing the Engineer completed daily extra work reports shall only apply to work paid for on a force account basis.

The cost accounting records for the contract shall be maintained separately from other contracts, during the life of the contract, and for a period of not less than 3 years after the date of acceptance of the contract. If the Contractor intends to file claims against the Department, the Contractor shall keep the cost accounting records specified above until complete resolution of all claims has been reached.
5-1.21 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

The location of the project is within an area controlled by the Regional Water Quality Control Board. Regional Water Quality Control Board WDID No. 5A29NP00005 has been issued covering work to be performed under this contract. The Contractor shall be fully informed of rules, regulations, and conditions that may govern the Contractor's operations in the areas and shall conduct the work accordingly.

Copies of the order may be obtained at the City of Grass Valley Engineering Division Office located at 125 East Main Street, Grass Valley, CA 95945 [telephone (530) 274-4373].

Attention is directed to Section 5-1.36, "Property and Facility Preservation," and Section 7-1.05, "Indemnification," and Section 7-1.06, “Insurance,” of the Standard Specifications.

5-1.22 CONTRACTOR'S LICENSING LAWS

Attention is directed to the requirements specified in Section 3-1.06, "Contractor License", of the Standard Specifications. The Contractor shall possess a valid California Class “A” Contractor's License, or a combination of the following classes: C-8 - Concrete Contractor, C10 – Electrical Contractor, C12 - Earthwork and Paving Contractors, C31 - Construction Zone Traffic Control Contractor, C32 - Parking and Highway Improvement Contractor, C45 - Sign Contractor, and D-63 Construction Cleanup Contractor, and all other classes required by the categories and types of work included in the contract at the time of the bid award. All licenses shall remain in effect throughout the term of the contract.

5-1.23 ARBITRATION

Section 9-1.22, "Arbitration," of the Standard Specifications is amended in its entirety to read as follows:

Section 9-1.22, “Dispute Resolution”

9-1.22 All claims filed with the City must be in writing and include the documents necessary to substantiate the claim. Claims must be filed within the time limits set forth in this contract. In no circumstances, however, may a claim be filed after the day of final payment. Nothing in this subsection is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth elsewhere in this contract.

1) Claims of $50,000.00 or Less

(a) The City will respond in writing to all written claims less than or equal to fifty thousand dollars ($50,000.00) within forty-five (45) days of receipt of the claim. Within thirty (30) days of receipt of the claim, the City may request any additional documentation supporting the claim or relating to defenses or claims the City may have against the claimant.

(b) If additional information is thereafter required, it shall be requested and provided pursuant to this subsection, upon mutual agreement of the City and the claimant.

(c) The City’s written response to the claim, as further documented, shall be submitted to the claimant within fifteen (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.

2) Claims Between $50,000.01 and $375,000.00

(a) The City will respond in writing to all written claims between fifty thousand dollars and one cent ($50,000.01) and less than or equal to three hundred seventy-five thousand dollars ($375,000.00), within sixty (60) days of receipt of the claim. Within thirty (30) days of receipt of the claim, the City may request, in writing, any additional documentation supporting the claim or relating to defense to the claim the City may have against the claimant.

(b) If additional information is thereafter required, it shall be requested and provided pursuant to this Subdivision, upon mutual agreement of the City and the claimant.

(c) The City’s written response to the claim, as further documented, shall be submitted to the claimant within thirty (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 documents, whichever is greater.
3) **Claims in Excess of $375,000.00**  The City shall, within a reasonable time after the presentation of any claim in excess of $375,000.00, make a decision in writing on such claim.

4) **Meet and Confer Conference**

   (a) If the claimant disputes the City’s written response, or the City fails to respond within the time prescribed, the claimant may so notify the City, in writing, either within fifteen (15) days of receipt of the City’s response or within fifteen (15) days of the City’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 City shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

   (b) If, following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to 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 California Government Code. For the 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 this Section 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.

5) **Contractor’s Duty During Claim Resolution:** The Contractor shall proceed with the Work in accordance with the plans and specifications and determinations and instructions of the City Engineer during the resolution of any claims disputes.

6) **Certification.** The Contractor shall certify in writing, at the time of submission of any claim, as follows:

   I certify under penalty of perjury under the laws of the State of California, that the claim is made in good faith, that the supporting data are accurate and complete, and that the amount requested accurately reflects the monies due for work performed under the Contract for which the City of Grass Valley is liable.

   By:_________________________
   (Contractor’s signature)

7) **City Remedies.** In the event the Contractor refuses or neglects to make good any loss or damage for which the Contractor is responsible under this Contract, the City may itself, or by the employment of others, make good any such loss or damage, and the cost and expense of doing so, including any reasonable engineering, legal and other consultant fees, and any costs of administrative and managerial services, shall be charged to the Contractor. Such costs and expenses may be deducted by the City from claims for payment made by the Contractor for work completed or remaining to be completed.

8) **Assignment.** In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and all subcontractors shall offer and agree to assign to the City all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or subcontract. This assignment shall be made and become effective at the time the City tenders final payment to the Contractor, without further acknowledgment by the parties.

9) **Contractor Waiver and Limitation.** The Contractor agrees that it can be adequately compensated by money damages for any breach of this Contract which may be committed by the City and hereby agrees that no default, act, or omission of the City or the Engineer, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of this Contract or (unless the City shall so consent or direct in writing) to suspend or abandon performance of all or any part of the work. The Contractor hereby waives any and all rights and remedies to which it might otherwise be or become entitled, save only its right to money damages.

10) **Venue.** Any litigation arising out of this Contract shall be brought in the Superior Court of Nevada County, and the Contractor hereby waives the removal provisions of Code of Civil Procedure Section 394.
5-1.24  NOTICE OF POTENTIAL CLAIM

Attention is directed to the requirements specified in Section 5-1.43, “Potential Claims And Dispute Resolution,” of the Standard Specifications.

5-1.25  FINAL PAYMENT AND CLAIMS

Attention is directed to Section 9-1.17D, "Final Payment and Claims,” of the Standard Specifications.

If the Contractor files a timely written statement of claims in response to the proposed final estimate, the City will submit a claim position letter to the Contractor by hand delivery or deposit in the U.S. mail. The claim position letter will delineate the City's position on the Contractor's claims. If the Contractor disagrees with the claim position letter, the Contractor shall submit a written notification of its disagreement to be received by the City not later than 15 days after the Contractor's receipt of the claim position letter. The written notification of disagreement shall set forth the basis for the Contractor's disagreement and be submitted to the office designated in the claim position letter. The Contractor's failure to provide a timely, written notification of disagreement shall constitute the Contractor's acceptance and agreement with the determinations provided in the claim position letter and with final payment pursuant to the claim position letter.

If the Contractor files a timely notification of disagreement with the City claim position letter, the City Engineer or a board of review appointed by the City Engineer shall review claims that remain in dispute and may meet with the Contractor within 45 days after receipt by the City of the notification of disagreement. Attendance by the Contractor at the City meeting concerning the notification of disagreement shall be mandatory.

If the City fails to submit a claim position letter to the Contractor within 135 days after the acceptance of the contract and the Contractor has claims that remain in dispute, the Contractor may request a meeting with the City Engineer or a board of review appointed by the City Engineer to review claims that remain in dispute. The Contractor's request for a meeting shall identify the claims that remain in dispute. If the Contractor files a request for a meeting, the City Engineer or a board of review appointed by the City Engineer will meet with the Contractor within 45 days after the City receives the request for the meeting. Attendance by the Contractor at this review meeting shall be mandatory.

Failure of the Contractor to file a timely written statement of claims in response to the proposed final estimate, or to file a timely notification of disagreement with the City’s claim position letter, or to attend the City’s review meeting shall constitute a failure to pursue diligently and exhaust the administrative remedies in the contract and shall be a bar to future legal proceedings by Contractor.

5-1.26  SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations, and to California Public Contract Code Section 10295.5.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with California Public Contract Code Section 10295.5.

5-1.27  REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.07, " Delays,” of the Standard Specifications.

5-1.28  EXCAVATION SAFETY PLANS

The Contractor’s attention is directed to requirements of “Earthwork,” of the Special Provisions concerning Temporary Shoring Plan and Section 7-1.02K(6)(b), " Excavation Safety,” of the Standard Specifications.

The Contractor shall submit a Temporary Shoring Safety System Plan to the Engineer in accordance with “Earthwork,” of these Special Provisions. The Contractors attention is directed to the requirements specified in Section “Earthwork,” of these Special Provisions.

Full compensation for conforming to the provisions of this section, not otherwise provided for in other sections of these Special Provisions, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.
5-1.29  AIR POLLUTION CONTROL

Air pollution control shall conform to the provisions of Section 14-9, “Air Quality,” of the Standard Specifications and these Special Provisions.

No burning of materials to be disposed of will be permitted for this project.

Full compensation for conforming to the provisions of this section including, but not limited to, obtaining permits and performing work in accordance with any permit requirements, not otherwise provided for, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

5-1.30  PERMITS

Attention is directed to the provisions in Sections 5-1.20B, “Permits, Licenses, Agreements, and Certifications,” of the Standard Specifications and these Special Provisions.

Full compensation for conforming to the provisions in this Section and to the requirements in the permit, not otherwise provided for in other sections of these Special Provisions, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

5-1.31  INSURANCE

Throughout the period of this agreement, the CONTRACTOR shall provide the following minimum insurance coverage as listed below. CONTRACTOR shall file with CITY certificate(s) of Insurance and endorsements, in a form acceptable to CITY, and consistent with this agreement at the time of execution of this agreement. The insurance company must be acceptable to CITY, with a Best's Rating of no less than A:VII. Documentation of such rating acceptable to the CITY shall be provided at the same time Insurance Certificates are submitted.

Any deductibles must be declared to, and approved by, the City.

In the event any of the required policies are canceled prior to the completion of the project and the CONTRACTOR does not furnish a new certificate(s) of insurance prior to cancellation, the CITY may obtain the required insurance and deduct the premium(s) from Contract monies due the CONTRACTOR.

5-1.31.1  WORKER'S COMPENSATION AND EMPLOYERS LIABILITY INSURANCE

The CONTRACTOR shall maintain adequate Workers' Compensation Insurance under the Laws of the State of California. CONTRACTOR shall comply with the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for Workers' Compensation or to undertake self insurance in accordance with the provisions of that Code, before commencing the performance of the work. CONTRACTOR shall require all subcontractors to maintain adequate Workers' Compensation Insurance. Certificates of such Workers' Compensation shall be filed forthwith with the CITY upon demand.

By CONTRACTOR'S signature hereunder, CONTRACTOR certifies that he/she is aware of the provisions of Section 3700 of the California 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 he/she will comply with such provisions before commencing the performance of this Contract. If such insurance is underwritten by any agency other than State Compensation Fund, such agency shall be a company authorized to do business in the State of California.

Worker's Compensation Insurance shall be provided as required by any applicable law or regulation. Employer's liability insurance shall be provided in amounts not less than the following:

- One Million dollars ($1,000,000) each accident for bodily injury by accident
- One Million dollars ($1,000,000) policy limit for bodily injury by disease
- One Million dollars ($1,000,000) each employee for bodily injury by disease

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

Each Worker's Compensation policy shall be endorsed with the following specific language:

Cancellation Notice: "This policy shall not be canceled or materially changed without first giving thirty (30) days prior written notice to the City of Grass Valley."

Waiver of Subrogation: "The Insurance Company agrees to waive all rights of subrogation against the City of Grass Valley, its elected or appointed officials, agents, employees and volunteers for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the City of Grass Valley."

5-1.31.2  GENERAL LIABILITY INSURANCE

Commercial General Liability insurance covering all operations by or on behalf of CONTRACTOR, providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and
including coverage for: premises; operations; products and completed operations; contractual liability insuring the obligations assumed by CONTRACTOR in this Agreement; broad form property damage (including completed operations); explosion, collapse, and underground hazards; personal injury liability.

Except with respect to bodily injury and property damage included within the products and completed operations hazards, the aggregate limits, where applicable, shall apply separately to CONTRACTOR'S work under the Contract.

One of the following forms is required: Commercial General Liability (Occurrence); or Commercial General Liability (Claims Made).

If CONTRACTOR carries a Commercial General Liability (Occurrence) policy:

1. The limits of liability shall not be less than:
   - One Million dollars ($1,000,000) each occurrence (combined single limit for bodily injury and property damage)
   - One Million dollars ($1,000,000) Personal Injury Liability
   - Two Million dollars ($2,000,000) Products-Completed Operations
   - Two Million dollars ($2,000,000) General Aggregate

2. If the policy does not have an endorsement providing that the General Aggregate Limit applies separately, or if defense costs are included in the aggregate limits, then the required aggregate limits shall be Two Million dollars ($2,000,000).

5-1.31.3 CONFORMITY OF COVERAGES

If more than one policy is used to meet the required coverages, such as a separate umbrella policy, such policies shall be consistent with all other applicable policies used to meet these minimum requirements. For example, all policies shall be Occurrence Liability policies, or all shall be Claims Made Liability policies if approved by the CITY as noted above. In no case shall the types of coverages be different.

5-1.31.4 ADDITIONAL REQUIREMENTS

Premium Payments: The insurance companies shall have no recourse against the CITY and funding agencies, its officers and employees or any of them for payment of any premiums or assessments under any policy issued by a mutual insurance company.

Policy Deductibles: The CONTRACTOR shall be responsible for all deductibles in all of CONTRACTOR’S insurance policies. The amount of deductibles for insurance coverage required herein should be reasonable and subject to CITY’S approval.

CONTRACTOR’S Obligations: CONTRACTOR’S indemnity and other obligations shall not be limited by the foregoing insurance requirements and shall survive the expiration of this agreement.

Material Breach: Failure of the CONTRACTOR to maintain the insurance required by this agreement, or to comply with any of the requirements of this section, shall constitute a material breach of the entire agreement.

Duration of Coverage: City must be an additional insured for completed operations for a period of one (1) year after completion of the work.

Project Reference: The Certificate of Insurance must reference the project specifically by project title

5-1.31.5 ENDORSEMENTS

Each Commercial General Liability policy shall be endorsed with the following specific language:

Cancellation Notice: "This policy shall not be canceled, material reduced, or materially changed without first giving thirty (30) days prior written notice to the City of Grass Valley."

"Provisions Regarding the Insured’s Duties: Any failure to comply with reporting provisions of the policy or breaches or violations of warranties shall not affect coverage provided to the City of Grass Valley, its elected or appointed officers, officials, employees or volunteer."

"Except as stated above, nothing herein shall be held to waive, alter or extend any of the limits, conditions, agreements or exclusions of the policy to which this endorsement is attached."

"The City of Grass Valley, and additional insureds, and all insureds officers, agents, outside parties hired to inspect and/or design the work, employees, and volunteers are to be covered as insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement."

The City of Grass Valley’s policy of insurance shall be excess and noncontributing. "The insurance provided by the Contractor, including any excess liability or umbrella form coverage, is primary coverage to the City of Grass Valley and additional insureds, with respect to any insurance or self-insurance programs maintained by the City of Grass Valley and additional insureds, and no insurance held or owned by the City of Grass Valley and additional insureds shall be called upon to contribute to a loss."
5-1.31.6 AUTOMOBILE LIABILITY INSURANCE

CONTRACTOR shall provide Automobile Liability insurance covering bodily injury and property damage in an amount no less than One Million dollars ($1,000,000) combined single limit for each occurrence.

Covered vehicles shall include owned, non-owned, and hired automobiles/trucks.

Endorsements: The endorsements listed above for General Liability shall also apply to the Automobile Liability Policy.

5-1.32 WARRANTY

Should any failure of the work occur within a period of one year from the acceptance of the project by the Grass Valley City Council due to faulty materials, poor workmanship, or defective equipment, the Contractor shall promptly make the needed repairs at his or her expense in accordance with the Special Provisions and to the satisfaction of the Engineer.

Security for this warranty shall be in the form of the Performance Bond, required elsewhere in these specifications, which shall remain in effect for a period of one (1) year after acceptance of the project by the Grass Valley City Council. The Performance Bond will not be reduced to an amount less than the bid amount of the project prior to the expiration of the one (1) year warranty period.

The City is hereby authorized to make such repairs, or to have such repairs made by others, if the Contractor fails to make such repairs, or to have such repairs made by others, if the Contractor fails to make or undertake with due diligence the aforesaid repairs within ten (10) days after receiving written notice of such failure or within a time specified in the notice if different; provided, however, that in case of an emergency where, in the opinion of the Engineer, that delay would cause serious loss or damages, or a serious hazard to the public, and a reasonable attempt has been made to notify the Contractor, the repairs may be made without prior notice to the Contractor; and the Contractor’s sureties shall be liable for the entire cost thereof.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 MEASUREMENT OF QUANTITIES

Attention is directed to the provisions in Section 9-1.02, "Measurement," of the Standard Specifications and these Special Provisions.

Within the limits of the project or at the plant site, the contractor shall provide a vehicle platform scale of sufficient weighing capacity to check full production sized batches from the proportioning scales to be used in producing materials for the project. This vehicle platform scale shall conform to the provisions in Section 9-1.02, “Measurement,” of the Standard Specifications.

Full compensation for conforming to the provisions of this section, not otherwise provided for, shall be considered as included in prices paid for the various Contract items of work involved and no additional compensation will be allowed.

8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains the following list of Pre-qualified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Pre-qualified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Pre-qualified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-3.05E, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

For those categories of materials included on the list of Pre-qualified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included on the list of Pre-qualified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Standard Specifications.

Materials and products may be added to the list of Pre-qualified and Tested Signing and Delineation Materials if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests.
Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

8-1.02.1 PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective With Abrasion Resistant Surface (ARS)
A. Apex, Model 921AR (4” x 4”)
B. Avery Dennison, Models C88 (4” x 4”), 911 (4” x 4”) and 953 (2.75” x 4.5”)
C. Ray-O-Lite, Model "AA" ARS (4” x 4”)
D. 3M Series 290 (3.5” x 4”)
E. 3M Series 290 PSA, with pressure sensitive adhesive pad (3.5” x 4”)

Retroreflective With Abrasion Resistant Surface (ARS) (for recessed applications only)
A. Avery Dennison, Model 948 (2.3” x 4.7”)
B. Avery Dennison, Model 944SB (2” x 4”)*
C. Ray-O-Lite, Model 2002 (2.3” x 4.6”)
D. Ray-O-Lite, Model 2004 ARS (2” x 4”)*
*For use only in 4.5 inch wide (older) recessed slots

Non-Reflective, 4 inches Round
A. Apex Universal (Ceramic)
B. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
C. Glowlite, Inc. (Ceramic)
E. Interstate Sales, "Diamond Back" (Polypropylene)
F. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
G. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
H. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)

8-1.02.2 PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)
A. Vega Molded Products "Temporary Road Marker" (3” x 4”)

Temporary Markers For Short Term Day/Night Use (14 days or less)
(For seal coat or chip seal applications, clear protective covers are required)
A. Apex Universal, Model 932
B. Bunzl Extrusion, Models T.O.M., T.R.P.M., and "HH" (High Heat)
C. Hi-Way Safety, Inc., Model 1280/1281
D. Glowlite, Inc., Model 932

8-1.02.3 STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape
A. Advanced Traffic Marking, Series 300 and 400
B. Brite-Line, Series 1000
C. Brite-Line, "DeltaLine XRP"
D. Swarco Industries, "Director 35" (For transverse application only)
E. Swarco Industries, "Director 60"
F. 3M, "Stamark" Series 380 and 5730
G. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)
A. Advanced Traffic Marking, Series 200
B. Brite-Line, Series 100
C. Garlock Rubber Technologies, Series 2000
D. P.B. Laminations, Aztec, Grade 102
E. Swarco Industries, "Director-2"
F. Trelleborg Industries, R140 Series
G. 3M, Series 620 "CR", and Series A750
H. 3M, Series A145, Removable Black Line Mask
(Black Tape: for use only on Asphalt Concrete Surfaces)
I. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: for use only on Asphalt Concrete Surfaces)
J. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Asphalt Concrete Surfaces)
K. Trelleborg Industries, RB-140
(Black Tape: for use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)
A. Avery Dennison, "Hotape"
B. Flint Trading, "Premark," "Premark 20/20 Flex," and "Premark 20/20 Flex Plus"
C. Ennis Paint Inc., "Flametape"

Ceramic Surfacing Laminate, 6" x 6"
A. Highway Ceramics, Inc.

8-1.02.4 CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 66 inches
A. Bunzl Extrusion, "Flexi-Guide Models 400 and 566"
B. Carsonite, Curve-Flex CFRM-400
C. Carsonite, Roadmarker CRM-375
D. FlexStake, Model 654 TM
E. GreenLine Models HWD1-66 and CGD1-66

Special Use Type, 66 inches
A. Bunzl Extrusion, Model FG 560 (with 18 inches U-Channel base)
B. Carsonite, "Survivor" (with 18 inches U-Channel base)
C. Carsonite, Roadmarker CRM-375 (with 18 inches U-Channel base)
D. FlexStake, Model 604
E. GreenLine Models HWDU and CGD (with 18 inches U-Channel base)
F. Impact Recovery Model D36, with #105 Driveable Base
G. Safe-Hit with 8 inches pavement anchor (SH248-GP1)
H. Safe-Hit with 15 inches soil anchor (SH248-GP2) and with 18 inches soil anchor (SH248-GP3)

Surface Mount Type, 48 inches
A. Bent Manufacturing Company, Masterflex Model MF-180EX-48
B. Carsonite, "Super Duck II"
C. FlexStake, Surface Mount, Models 704 and 754 TM
D. Impact Recovery Model D48, with #101 Fixed (Surface-Mount) Base
E. Three D Traffic Works "Chanelflex" ID No. 522248W

8-1.02.5 CHANNELIZERS

Surface Mount Type, 36 inches
A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
B. Bunzl Extrusion, Flexi-Guide Models FG300PE and FG300UR
C. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
D. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
E. FlexStake, Surface Mount, Models 703 and 753 TM
F. GreenLine, Model SMD-36
H. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
I. Repo, Models 300 and 400
J. Safe-Hit, Guide Post, Model SH236SMA
K. Three D Traffic Works "Channelflex" ID No. 522053W

Lane Separation System
A. Bunzl "Flexi-Guide (FG) 300 Curb System"
B. Qwick Kurb, "Klemmfix Guide System"
C. Recycled Technology, Inc. "Safe-Lane System"

8-1.02.6 CONICAL DELINEATORS, 42 inches

(For 28 inch Traffic Cones, see Standard Specifications)
A. Bent Manufacturing Company "T-Top"
B. Plastic Safety Systems "Navigator-42"
C. Radiator Specialty Company "Enforcer"
D. Roadmaker Company "Stacker"
E. Traffix Devices "Grabber"
F. Three D Traffic Works "Ringtop" TD7000, ID No. 742143

8-1.02.7 OBJECT MARKERS

Type "K", 18 inches
A. Bunzl, Model FG318PE
B. Carsonite, Model SMD 615
C. FlexStake, Model 701 KM
D. Repo, Models 300 and 400
E. Safe-Hit, Model SH718SMA

Type "K-4" / "Q" Object Markers, 24 inches
A. Bent Manufacturing "Masterflex" Model MF-360-24
B. Bunzl Extrusion, Model FG324PE
C. Carsonite, Super Duck II
D. FlexStake, Model 701KM
E. Repo, Models 300 and 400
F. Safe-Hit, Models SH8 24SMA WA and SH8 24GP3 WA
G. The Line Connection, Model DP21-4Q
H. Three D Traffic Works "Q" Marker, ID No. 531702W

8-1.02.8 BARRIER MARKERS AND TEMPORARY RAILING REFLECTORS

Impactable Type
A. ARTUK, "FB"
B. Bunzl Extrusion, Models PCBM-12 and PCBM-T12
C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
D. Hi-Way Safety, Inc., Model GMKRM100
E. Plastic Safety Systems "BAM" Models OM-BARR and OM-BWAR
F. Three D Traffic Works "Roadguide" Model TD 9304

Non-Impactable Type
A. ARTUK, JD Series
B. Plastic Safety Systems "BAM" Models OM-BITARW and OM-BITARA
C. Vega Molded Products, Models GBM and JD
D. Plastic Vacuum Forming, "Cap-It C400"

8-1.02.9 METAL BEAM GUARD RAIL POST MARKERS

(For use to the left of traffic)
A. Bunzl Extrusion, "Mini" (3” x 10”)
B. Creative Building Products, "Dura-Bull, Model 11201"
C. Duraflex Corp., "Railrider"
D. Plastic Vacuum Forming, "Cap-It C300"

8-1.02.10 CONCRETE BARRIER DELINEATORS, 16 inches

(For use to the right of traffic)
A. Bunzl Extrusion, Model PCBM T-16
B. Safe-Hit, Model SH216RBM

8-1.02.11 CONCRETE BARRIER-MOUNTED MINI-DRUM (10 inches x 14 inches x 22 inches)

A. Stinson Equipment Company "SaddleMarker"

8-1.02.12 SOUND WALL DELINEATOR

(Applied vertically. Place top of 3” x 12” reflective element at 48 inches above roadway)
A. Bunzl Extrusion, PCBM S-36

8-1.02.13 GUARD RAILING DELINEATOR

(Place top of reflective element at 48 inches above plane of roadway)

Wood Post Type, 27 inches
A. Bunzl Extrusion, FG 427 and FG 527
B. Carsonite, Model 427
C. FlexStake, Model 102 GR
D. GreenLine GRD 27
E. Safe-Hit, Model SH227GRD
F. Three D Traffic Works "Guardflex" TD9100

Steel Post Type
A. Carsonite, Model CFG-327 with CFGRBK300 Mounting Bracket

8-1.02.14 RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators
A. Avery Dennison T-6500 Series (For rigid substrate devices only)
B. Avery Dennison WR-6100 Series
C. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
D. Reflexite, PC-1000 Metalized Polycarbonate
E. Reflexite, AC-1000 Acrylic
F. Reflexite, AP-1000 Metalized Polyester
G. Reflexite, Conformalight, AR-1000 Abrasion Resistant Coating
H. 3M, High Intensity

Traffic Cones, 13 inches Sleeves
A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

Traffic Cones, 4 inch x 6 inch Sleeves
A. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
B. Reflexite, Vinyl, "TR" (Semi-transparent) or "Conformalight"
C. 3M Series 3840
D. Avery Dennison S-9000C

Barrels and Drums
A. Avery Dennison WR-6100
B. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
C. Reflexite, "Conformalight", "Super High Intensity" or "High Impact Drum Sheeting"
D. 3M Series 3810

**Barricades: Type I, Medium-Intensity (Typically Enclosed Lens, Glass-Bead Element)**
A. American Decal, Adecolite
B. Avery Dennison, T-1500 and T-1600 series
C. 3M Engineer Grade, Series 3170

**Barricades: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)**
A. Avery Dennison, T-2500 Series
B. Kiwalite Type II
C. Nikkalite 1800 Series

**Signs: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)**
A. Avery Dennison, T-2500 Series
B. Kiwalite, Type II
C. Nikkalite 1800 Series

**Signs: Type III, High-Intensity (Typically Encapsulated Glass-Bead Element)**
A. Avery Dennison, T-5500 and T-5500A Series
B. Nippon Carbide Industries, Nikkalite Brand Ultralite Grade II
C. 3M Series 3870

**Signs: Type IV, High-Intensity (Typically Unmetallized Microprismatic Element)**
A. Avery Dennison, T-6500 Series
B. Nippon Carbide Industries, Crystal Grade, 94000 Series
C. Nippon Carbide Industries, Model No. 94847 Fluorescent Orange
D. Nippon Carbide Industries, Model No. 94844 Fluorescent Yellow Green

**Signs: Type VI, Elastomeric (Roll-Up) High-Intensity, without Adhesive**
A. Avery Dennison, WU-6014
B. Novabrite LLC, "Econobrite"
C. Reflexite "Vinyl"
D. Reflexite "SuperBright"
E. Reflexite "Marathon"
F. 3M Series RS34 Orange and RS20 Fluorescent Orange

**Signs: Type VII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)**
A. 3M LDP Series 3924 Fluorescent Orange
B. 3M LDP Series 3970

**Signs: Type VIII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)**
A. Avery Dennison, T-7500 Series
B. Avery Dennison, T-7511 Fluorescent Yellow
C. Avery Dennison, T-7513 Fluorescent Yellow Green
D. Avery Dennison, W-7514 Fluorescent Orange
E. Nippon Carbide Industries, Nikkalite Crystal Grade Series 92800
F. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92844 Fluorescent Yellow/Green
G. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92847 Fluorescent Orange

**Signs: Type IX, Very-High-Intensity (Typically Unmetallized Microprismatic Element)**
A. 3M VIP Series 3981 Diamond Grade Fluorescent Yellow
B. 3M VIP Series 3983 Diamond Grade Fluorescent Yellow/Green
C. 3M VIP Series 3990 Diamond Grade

**8-1.02.15 SPECIALTY SIGNS**

A. Hallmark Technologies, Inc., All Sign STOP Sign (All Plastic), 30 inches
B. Reflexite "Endurance" Work Zone Sign (with Semi-Rigid Plastic Substrate)
8-1.02.16 SIGN SUBSTRATE

Fiberglass Reinforced Plastic (FRP)
A. Fiber-Brite
B. Sequentia, "Polyplate"
C. Inteplast Group "InteCel" (0.5 inch for Post-Mounted CZ Signs, 48 inches or less)

Aluminum Composite
A. Alcan Composites "Dibond Material, 0.08 inch" (for temporary construction signs only)
B. Mitsubishi Chemical America, Alpolic 350 (for temporary construction signs only)

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Concrete," of the Standard Specifications and these Special Provisions.

Mineral admixture shall be combined with cement in conformance with the provisions in Section 901.02B(3), "Supplementary Cementitious Materials," of the Standard Specifications for the concrete materials.

The Department maintains a list of sources of fine and coarse aggregate that have been approved for use with a reduced amount of mineral admixture in the total amount of cementitious material to be used. A source of aggregate will be considered for addition to the approved list if the producer of the aggregate submits to the Transportation Laboratory certified test results from a qualified testing laboratory that verify the aggregate complies with the requirements. Prior to starting the testing, the aggregate test shall be registered with the Department. A registration number can be obtained by calling (916) 227-7228. The registration number shall be used as the identification for the aggregate sample in correspondence with the Department. Upon request, a split of the tested sample shall be provided to the Department. Approval of aggregate will depend upon compliance with the specifications, based on the certified test results submitted, together with any replicate testing the Department may elect to perform. Approval will expire 3 years from the date the most recent registered and evaluated sample was collected from the aggregate source.

Qualified testing laboratories shall conform to the following requirements:

A. Laboratories performing ASTM Designation: C 1293 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Concrete Proficiency Sample Program and shall have received a score of 3 or better on all tests of the previous 2 sets of concrete samples.
B. Laboratories performing ASTM Designation: C 1260 shall participate in the Cement and Concrete Reference Laboratory (CCRL) Pozzolan Proficiency Sample Program and shall have received a score of 3 or better on the shrinkage and soundness tests of the previous 2 sets of pozzolan samples.

Aggregates on the list shall conform to one of the following requirements:

A. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1293, the average expansion at one year shall be less than or equal to 0.040 percent; or
B. When the aggregate is tested in conformance with the requirements in California Test 554 and ASTM Designation: C 1260, the average of the expansion at 16 days shall be less than or equal to 0.15 percent.

The amounts of cement and mineral admixture used in cementitious material shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.02, "Materials," of the Standard Specifications and shall conform to the following:

A. The minimum amount of cement shall not be less than 75 percent by weight of the specified minimum cementitious material content.
B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
   1. When the calcium oxide content of a mineral admixture is equal to or less than 2 percent by weight, the amount of mineral admixture shall not be less than 15 percent by weight of the total amount of cementitious material to be used in the mix.
   2. When the calcium oxide content of a mineral admixture is greater than 2 percent by weight, and any of the aggregates used are not listed on the approved list as specified in these Special Provisions, then the amount of
mineral admixture shall not be less than 25 percent by weight of the total amount of cementitious material to be used in the mix.

3. When the calcium oxide content of a mineral admixture is greater than 2 percent by weight and the fine and coarse aggregates are listed on the approved list as specified in these Special Provisions, then the amount of mineral admixture shall not be less than 15 percent by weight of the total amount of cementitious material to be used in the mix.

4. When a mineral admixture that conforms to the provisions for silica fume in Section 90-1.02B(3), "Admixture Materials," of the Standard Specifications is used, the amount of mineral admixture shall not be less than 10 percent by weight of the total amount of cementitious material to be used in the mix.

5. When a mineral admixture that conforms to the provisions for silica fume in Section 90-1.02B(3), "Admixture Materials," of the Standard Specifications is used and the fine and coarse aggregates are listed on the approved list as specified in these Special Provisions, then the amount of mineral admixture shall not be less than 7 percent by weight of the total amount of cementitious material to be used in the mix.

C. The total amount of mineral admixture shall not exceed 35 percent by weight of the total amount of cementitious material to be used in the mix. The total weight of cement and mineral admixture per cubic yard shall not exceed the specified maximum cementitious material content.

Unless otherwise specified, mineral admixture will not be required in portland cement concrete used for precast concrete girders.

The Contractor will be permitted to use Type III Portland cement for concrete used in the manufacture of precast concrete members.

Materials provided by Caltrans are as indicated on Signing Plan and Signing Details plan sheets.

SECTION 9 (BLANK)

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.01 SCOPE OF WORK

The scope of work, in general, includes; installation of concrete sidewalk, curb, gutter and accessible ramps, hot mix asphalt paving and pavement marking modifications. Other related items not mentioned above, that are required by the plans, specifications or these Special Provisions shall be performed, placed, constructed, or installed.

10-1.02 GENERAL REQUIREMENTS

The order of work shall conform to the provisions in the Standard Specifications and these Special Provisions.

The Contractor’s attention is directed to the requirements of “Cooperation”, “Mobilization,” “Maintaining Traffic” and “Traffic Control System” of these Special Provisions, the Project Plans, and the Standard Specifications.

Except as otherwise provided or with City Engineer approval of reduced roadway widths, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays; after 4:00 p.m. Monday through Friday and when construction operations are not actively in progress.

Weekend hours of work, which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be adequately served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

The Contractor shall provide the Engineer all required submittals within the time frame specified by the Special Provisions, the Project Plans, and/or the Standard Specifications.

The Contractor shall submit to the Engineer a progress schedule in accordance with Section 8-1.02, “Schedule,” of the Standard Specifications and these Special Provisions. Attention is directed to the requirements of these sections for scheduling a pre-construction scheduling conference within 10 working days of the approval of the contract and submitting a baseline schedule to the Engineer within 20 days of the contract approval.

The Contractor is responsible for verifying the location of all existing underground facilities, within the project area, that may have potential to conflict with the location of proposed improvements, and other work as shown on the Plans. The City has made every effort to show locations of any and all existing surface and subsurface structures. However, actual field conditions and locations can vary considerably from the plan locations. Therefore, the City cannot, and does not, assume responsibility for the existence or location of any structure such as, but not limited to, utilities and pipelines. The contractor is responsible for contacting all agencies and/or owners to verify this information prior to and during construction of any of the
proposed improvements. If any existing utilities are found in conflict with the proposed location of the improvements shown on the plans, the Contractor shall contact the Engineer. The Engineer shall provide the Contractor with new grades to eliminate such conflict or shall arrange to have the utilities relocated to avoid the conflict. The Contractor shall work with the Engineer to schedule surveyors to be onsite during pot-holing of conflicts for utility elevation verification. Any delays, which may result from failure of the Contractor to pothole potential utility conflicts, shall be at the Contractor’s expense.

At the end of each working day if a difference in excess of three inches (3”) exists between the elevation of the existing pavement and the elevation of excavations within six feet (6’) of the traveled way, material shall be placed and compacted against the vertical cuts adjacent to the traveled way unless Type K barrier rail has been placed between the traveled way and the excavation in accordance with Section 12-3.08, “Type K Temporary Railing” of the Standard Specifications and these Special Provisions. During excavation operations, native material may be used for this purpose; however, once placing of the structural section commences, structural material shall be used. The material shall be placed to the level of the elevation of the top of existing pavement and tapered at a slope of 1:4 (vertical:horizontal) or flatter to the bottom of the excavation. Treated base shall not be used for the taper. Full compensation for placing the material on a 1:4 slope, regardless of the number of times the material is required, and subsequent removing or reshaping of the material to the lines and grades shown on the plans shall be considered as included in the contract price paid for the materials involved and no additional compensation will be allowed. No payment will be made for material placed in excess of that required for the structural section.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in the provisions of this section, including, but not limited to, coordination with the applicable utility companies, pot-holing, excavation and backfill as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in prices paid for the various Contract Items of work involved and no additional compensation will be allowed.

10-1.03 REQUEST FOR INFORMATION

All Requests for Information (RFI’s) from the Contractor shall be submitted in writing to the Engineer, and shall be numbered sequentially as they are generated. The Engineer will have 5 working days from the date of receipt of each RFI to provide a response to the Contractor. All requests must come from the prime Contractor, the Engineer will not respond to RFI’s received directly from subcontractors.

If the response provided by the Engineer is not satisfactory for the Contractor, the RFI may be re-submitted with more detailed requests noting the particular areas that have not been addressed. The Engineer will have three (3) working days to respond to the second request from the Contractor. If the second response is still not satisfactory to the Contractor, a meeting will be scheduled to resolve any outstanding items that have not been properly addressed.

A Request for Information shall only be used for obtaining information or clarification on project documents. The RFI process is not the proper media for notification of potential claims, writing letters, requesting a change order, etc… If the Contractor wishes to file a Notice of Potential Claim, it shall be filed in accordance with Section 5-1.43, “Potential Claims and Dispute Resolution,” of these Special Provisions.

10-1.04 LINES AND GRADES

Attention is directed to “Lines and Grades,” of the Standard Specifications.

The Contractor shall be responsible for setting stakes or marks that the Contractor determines to be necessary to establish the lines and grades required for the completion of the work specified. The Engineer reserves the right to check, correct or require layout work to be revised in order to construct the improvements as shown on the plans and as directed by the Engineer. If any stakes or marks are destroyed or damaged, it is the Contractor’s responsibility to reestablish the stakes or marks.

If the Contractor determines that conditions in the field would cause a conflict with the lines and grades shown on the plans or otherwise feels that there are errors in the lines and grades to be established he shall immediately notify the Engineer for clarification. Attention is directed to “Requests for Information” of these provisions.

Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.05 WATER POLLUTION CONTROL

10-1.05.1 GENERAL

Water pollution control work shall conform to the provisions in Section 13, "Water Pollution Control," of the Standard Specifications, section of these Special Provisions entitled "Relations With California Regional Water Quality Control Board," and these Special Provisions.

The Contractor shall perform water pollution control work in conformance with the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual” and
addenda in effect on the day the Notice to Contractors is dated. This manual is referred to as the "Preparation Manual." Copies of the Preparation Manual may be obtained from:

State of California  
Department of Transportation  
Publication Distribution Unit  
1900 Royal Oaks Drive  
Sacramento, California 95815  
Telephone: (916) 445-3520

The Preparation Manual and other references for performing water pollution control work are available from the Department's Construction Storm Water and Water Pollution Control web site at: http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm.

The Contractor shall know and fully comply with applicable provisions of the Manuals, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction. Attention is directed to Section 7, "Legal Relations and Responsibility to the Public," of the Standard Specifications and these Special Provisions.

Water pollution control requirements shall apply to storm water and non-storm water discharges from areas outside the project site that are directly related to construction activities for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards and access roads. The Contractor shall comply with the Manuals for those areas and shall implement, inspect and maintain the required water pollution control practices. Installing, inspecting and maintaining water pollution control practices on areas outside the highway right of way not specifically arranged and provided for by the Department for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or the City as a result of the Contractor's failure to comply with the provisions in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Manuals, and Federal, State and local regulations and requirements as set forth therein.

Penalties as used in this section shall include fines, penalties and damages, whether proposed, assessed, or levied against the Department or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of the Manuals, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violations, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

10-1.05.2 WATER POLLUTION CONTROL IMPLEMENTATION

Unless otherwise specified, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices. Unless otherwise directed by the Engineer, the Contractor's responsibility for "Water Pollution Control" implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.06, "Suspensions," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of water pollution control practices shall conform to the requirements in the Manuals and these Special Provisions.

If the Contractor or the Engineer identifies a deficiency in the implementation of the “Water Pollution Control” practices, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section. Attention is directed to Section 5-1.03, "Engineer's Authority," of the Standard Specifications, and to "Retention of Funds" of this section for possible nonconformance penalties.

If the Contractor fails to conform to the provisions of this section, "Water Pollution Control,” the Engineer may order the suspension of construction operations until the project complies with the requirements of this section.
10-1.05.3 PAYMENT

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in “Water Pollution Control” including, but not limited to installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices including non-storm water management, waste management and materials pollution water pollution control practices, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer shall be considered as included in the various items of work requiring these activities, and no additional compensation will be allowed therefore.

10-1.05.4 CONSTRUCTION SITE MANAGEMENT

Construction site management shall consist of controlling potential sources of water pollution before they come in contact with storm water systems or watercourses. The Contractor shall control material pollution and manage waste and non-storm water existing at the construction site by implementing effective handling, storage, use, and disposal practices.

The Contractor shall train all employees and subcontractors regarding:

A. Material pollution prevention and control;
B. Waste management;
C. Non-storm water management;
D. Identifying and handling hazardous substances; and
E. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances.

Training shall take place before starting work on this project. New employees shall receive the complete training before starting work on this project. The Contractor shall have regular meetings to discuss and reinforce spill prevention and control; material delivery, storage, use, and disposal; waste management; and non-storm water management procedures.

Instructions for material and waste handling, storage, and spill reporting and cleanup shall be posted at all times in an open, conspicuous, and accessible location at the construction site.

Non-hazardous construction site waste and excess material shall be recycled when practical or disposed of in accordance with the provisions in Section 5-1.20B(4), "Contractor-Property Owner Agreement," of the Standard Specifications, unless otherwise specified.

Vehicles and equipment at the construction site shall be inspected on a frequent, predetermined schedule, and by the operator each day of use. Leaks shall be repaired immediately, or the vehicle or equipment shall be removed from the construction site.

10-1.05.4.1 SPILL PREVENTION AND CONTROL

The Contractor shall implement spill and leak prevention procedures when chemicals or hazardous substances are stored. Spills of petroleum products; substances listed under CFR Title 40, Parts 110, 117, and 302; and sanitary and septic waste shall be contained and cleaned up as soon as is safe.

Minor spills involve small quantities of oil, gasoline, paint, or other material that can be controlled by the first responder upon discovery of the spill. Cleanup of minor spills includes:

A. Containing the spread of the spill,
B. Recovering the spilled material using absorption,
C. Cleaning the contaminated area, and
D. Disposing of contaminated material promptly and properly.

Semi-significant spills are those that can be controlled by the first responder with the help of other personnel. Cleanup of semi-significant spills shall be immediate. Cleanup of semi-significant spills includes:

A. Containing the spread of the spill;
B. Recovering the spilled material using absorption if the spill occurs on paved or an impermeable surface;
C. Containing the spill with an earthen dike and digging up contaminated soil for disposal if the spill occurs on dirt;
D. Covering the spill with plastic or other material to prevent contaminating runoff if the spill occurs during precipitation; and
E. Disposing of contaminated material promptly and properly.

Significant or hazardous spills are those that cannot be controlled by construction personnel. Notifications of these spills shall be immediate. The following steps shall be taken:

A. Construction personnel shall not attempt to cleanup the spill until qualified staff have arrived;
B. Notify the Engineer and follow up with a written report;
C. Obtain the services of a spills contractor or hazardous material team immediately;
D. Notify the local emergency response team by dialing 911 and county officials at the emergency phone numbers kept on the construction site;
E. Notify the Governor's Office of Emergency Services Warning Center at (805) 852-7550;
F. Notify the National Response Center at (800) 424-8802 regarding spills of Federal reportable quantities in conformance with CFR Title 40, Parts 110, 119, and 302;
G. Notify other agencies as appropriate, including:

1. Fire Department,
2. Public Works Department,
3. Highway Patrol,
4. City Police or County Sheriff Department,
5. Department of Toxic Substances,
6. California Division of Oil and Gas,
7. Cal OSHA, or
8. Regional Water Resources Control Board.

The contractor shall oversee and enforce proper spill prevention and control measures. Minor, semi-significant, and significant spills shall be reported to the contractor who shall notify the Engineer immediately.

The Contractor shall prevent spills from entering storm water runoff before and during cleanup. Spills shall not be buried or washed with water.

The Contractor shall keep material or waste storage areas clean, well organized, and equipped with enough cleanup supplies for the material being stored. Plastic shall be placed under paving equipment when not in use to catch drips.

10-1.05.4.2 MATERIAL MANAGEMENT

Material shall be delivered, used, and stored for this contract in a manner that minimizes or eliminates discharge of material into the air, storm drain systems, or watercourses.

The Contractor shall implement the practices described in this section when taking delivery of, using, or storing the following materials:

A. Hazardous chemicals including:

1. Acids,
2. Lime,
3. Glues,
4. Adhesives,
5. Paints,
6. Solvents, and
7. Curing compounds;

B. Soil stabilizers and binders;
C. Fertilizers;
D. Detergents;
E. Plaster;
F. Petroleum products including:

1. Fuel,
2. Oil, and
3. Grease;
G. Asphalt components and concrete components; and
H. Pesticides and herbicides.

The Contractor shall supply the Material Safety Data Sheet to the Engineer for material used or stored. The Contractor shall keep an accurate inventory of material delivered and stored at the construction site. Employees trained in emergency spill cleanup procedures shall be present when hazardous materials or chemicals are unloaded.

The Contractor shall use recycled or less hazardous products when practical.

Application of herbicides and pesticides shall be performed by a licensed applicator. The Contractor shall complete the Report of Chemical Spray forms when spraying herbicides or pesticides, and shall submit a copy to the Engineer before application.

**Material Storage**

The Contractor shall store liquids, petroleum products, and substances listed in CFR Title 40, Parts 110, 117, and 302 in containers or drums approved by the United States Environmental Protection Agency, and place them in secondary containment facilities.

Secondary containment facilities shall be impervious to the materials stored there for a minimum contact time of 72 hours.

Throughout the rainy season secondary containment facilities shall be covered during non-working days and when precipitation is predicted. Secondary containment facilities shall be adequately ventilated.

The Contractor shall keep the secondary containment facility free of accumulated rainwater or spills. After precipitation, or in the event of spills or leaks, accumulated liquid shall be collected and placed into drums within 24 hours. These liquids shall be handled as hazardous waste in accordance with the provisions in "Hazardous Waste" of these Special Provisions, unless testing determines them to be non-hazardous.

Incompatible materials, such as chlorine and ammonia, shall not be stored in the same secondary containment facility.

Materials shall be stored in the original containers with the original product labels maintained in legible condition. Damaged or illegible labels shall be replaced immediately.

The secondary containment facility shall have the capacity to contain precipitation from a 24-hour-long, 25-year storm; and 10 percent of the aggregate volume of all containers, or all of the volume of the largest container within the facility, whichever is greater.

The Contractor shall store bagged or boxed material on pallets. Throughout the rainy season, bagged or boxed material shall be protected from wind and rain during non-working days and when precipitation is predicted.

The Contractor shall provide sufficient separation between stored containers to allow for spill cleanup or emergency response access. Storage areas shall be kept clean, well organized, and equipped with cleanup supplies appropriate for the materials being stored.

The Contractor shall repair or replace perimeter controls, containment structures, covers, and liners as needed. Storage areas shall be inspected before and after precipitation, and at least weekly during other times.

**Stockpile Management**

The Contractor shall reduce or eliminate potential air and water pollution from stockpiled material including soil, paving material, or pressure treated wood. Stockpiles shall be located out of floodplains when possible, and at least 50 feet from concentrated flows of storm water, drainage courses, or inlets unless written approval is obtained from the Engineer.

The Contractor may discontinue adding or removing material for up to 21 days and a stockpile will still be considered active.

The Contractor shall protect active stockpiles with plastic or geotextile cover, soil stabilization measures, or with linear sediment barrier when precipitation is predicted. Active stockpiles of cold mix asphalt concrete shall be placed on an impervious surface and covered with plastic when precipitation is predicted.

The Contractor shall protect inactive soil stockpiles with a plastic or geotextile cover, or with soil stabilization measures at all times during the rainy season. A linear sediment barrier around the perimeter of the stockpile shall also be used. During the non-rainy season soil stockpiles shall be covered and protected with a linear sediment barrier when precipitation is predicted. The Contractor shall control wind erosion during dry weather as provided in "Dust Control," of the Standard Specifications.
Stockpiles of portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub-base shall be covered with plastic or geotextile, or protected with a linear sediment barrier at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

Stockpiles of cold mix asphalt concrete shall be placed on and covered with impermeable material at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

Stockpiles of pressure treated wood shall be covered with impermeable material and placed on pallets at all times during the rainy season, and when precipitation is predicted during the non-rainy season.

The Contractor shall repair or replace linear sediment barriers and covers as needed or as directed by the Engineer to keep them functioning properly. Sediment shall be removed when it accumulates to 1/3 of the linear sediment barrier height.

10-1.05.4.3 WASTE MANAGEMENT

Solid Waste

The Contractor shall not allow litter or debris to accumulate anywhere on the construction site, including storm drain grates, trash racks, and ditch lines. The Contractor shall pick up and remove trash and debris from the construction site at least once a week. The contractor shall monitor solid waste storage and disposal procedures on the construction site. The Contractor shall provide enough dumpsters of sufficient size to contain the solid waste generated by the project. Dumpsters shall be emptied when refuse reaches the fill line. Dumpsters shall be watertight. The Contractor shall not wash out dumpsters on the construction site. The Contractor shall provide additional containers and more frequent pickup during the demolition phase of construction.

Solid waste includes:

A. Brick,
B. Mortar,
C. Timber,
D. Metal scraps,
E. Sawdust,
F. Pipe,
G. Electrical cuttings,
H. Non-hazardous equipment parts,
I. Styrofoam and other packaging materials,
J. Vegetative material and plant containers from highway planting, and
K. Litter and smoking material, including litter generated randomly by the public.

Trash receptacles shall be provided and used in the Contractor's yard, field trailers, and locations where workers gather for lunch and breaks.

Hazardous Waste

The Contractor shall implement hazardous waste management practices when waste is generated on the construction site from the following substances:

A. Petroleum products,
B. Asphalt products,
C. Concrete curing compound,
D. Pesticides,
E. Acids,
F. Paints,
G. Stains,
H. Solvents,
I. Wood preservatives,
J. Roofing tar, and
K. Materials classified as hazardous by California Code of Regulations, Title 22, Division 4.5; or listed in CFR Title 40, Parts 110, 117, 261, or 302.

Nothing in these Special Provisions shall relieve the Contractor of the responsibility for compliance with Federal, State, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
The CONTRACTOR shall oversee and enforce hazardous waste management practices. Production of hazardous materials and hazardous waste on the construction site shall be kept to a minimum. Perimeter controls, containment structures, covers, and liners shall be repaired or replaced when damaged.

The Contractor shall have a laboratory certified by the Department of Health Services (DHS) sample and test waste when hazardous material levels are unknown to determine safe methods for storage and disposal.

The Contractor shall segregate potentially hazardous waste from non-hazardous waste at the construction site. Hazardous waste shall be handled, stored, and disposed of as required in California Code of Regulations, Title 22, Division 4.5, Section 66262.34; and in CFR Title 49, Parts 261, 262, and 263.

The Contractor shall store hazardous waste in sealed containers constructed and labeled with the contents and date accumulated as required in California Code of Regulations, Title 22, Division 4.5; and in CFR Title 49, Parts 172, 173, 178, and 179. Hazardous waste containers shall be kept in temporary containment facilities conforming to the provisions in "Material Storage" of these Special Provisions.

There shall be adequate storage volume and containers shall be conveniently located for hazardous waste collection. Containers of hazardous waste shall not be overfilled and hazardous wastes shall not be mixed. Containers of dry waste that are not watertight shall be stored on pallets. The Contractor shall not allow potentially hazardous waste to accumulate on the ground. Hazardous waste shall be stored away from storm drains, watercourses, moving vehicles, and equipment.

The Contractor shall clean water based or oil based paint from brushes or equipment within a contained area and shall not contaminate soil, watercourses, or storm drain systems. Paints, thinners, solvents, residues, and sludges that cannot be recycled or reused shall be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths shall be disposed of as solid waste.

The Contractor shall dispose of hazardous waste within 90 days of being generated. Hazardous waste shall be disposed of by a licensed hazardous waste transporter using uniform hazardous waste manifest forms and taken to a Class I Disposal Site. A copy of the manifest shall be provided to the Engineer.

**Contaminated Soil**

The Contractor shall identify contaminated soil from spills or leaks by noticing discoloration, odors, or differences in soil properties. Soil with evidence of contamination shall be sampled and tested by a laboratory certified by DHS. If levels of contamination are found to be hazardous, the soil shall be handled and disposed of as hazardous waste.

The Contractor shall prevent the flow of water, including ground water, from mixing with contaminated soil by using one or a combination of the following measures:

A. Berms,
B. Cofferdams,
C. Grout curtains,
D. Freeze walls, or
E. Concrete seal course.

If water mixes with contaminated soil and becomes contaminated, the water shall be sampled and tested by a laboratory certified by the DHS. If levels of contamination are found to be hazardous, the water shall be handled and disposed of as hazardous waste.

**Concrete Waste**

The Contractor shall implement practices to prevent the discharge of portland cement concrete or asphalt concrete waste into storm drain systems or watercourses.

Portland cement concrete or asphalt concrete waste shall be collected at the following locations and disposed of:

A. Where concrete material, including grout, is used;
B. Where concrete dust and debris result from demolition;
C. Where sawcutting, coring, grinding, grooving, or hydro-concrete demolition of portland cement concrete or asphalt concrete creates a residue or slurry; or
D. Where concrete trucks or other concrete-coated equipment is cleaned at the construction site.

Sanitary and Septic Waste

Wastewater from sanitary or septic systems shall not be discharged or buried within the Department right of way. The CONTRACTOR shall inspect sanitary or septic waste storage and monitor disposal procedures at least weekly. Sanitary facilities that discharge to the sanitary sewer system shall be properly connected and free from leaks.

The Contractor shall obtain written approval from the local health agency, city, county, and sewer district before discharging from a sanitary or septic system directly into a sanitary sewer system, and provide a copy to the Engineer. The Contractor shall comply with local health agency requirements when using an on-site disposal system.

Liquid Waste

The Contractor shall not allow construction site liquid waste, including the following, to enter storm drain systems or watercourses:

A. Drilling slurries or fluids,
B. Grease-free or oil-free wastewater or rinse water,
C. Dredgings,
D. Liquid waste running off a surface including wash or rinse water, or
E. Other non-storm water liquids not covered by separate permits.

The Contractor shall hold liquid waste in structurally sound, leak proof containers such as:

A. Sediment traps,
B. Roll-off bins, or
C. Portable tanks.

Liquid waste containers shall be of sufficient quantity and volume to prevent spills and leaks. The containers shall be stored at least 50 feet from storm drains, watercourses, moving vehicles, and equipment.

The Contractor shall remove and dispose of deposited solids from sediment traps as provided in "Solid Waste" of these Special Provisions, unless determined infeasible by the Engineer.

Liquid waste may require testing to determine hazardous material content before disposal. Drilling fluids and residue shall be disposed of outside the highway right of way. If the Engineer determines that an appropriate location is available, fluids and residue exempt under California Code of Regulations, Title 23, Section 2511(g) may be dried by infiltration and evaporation in a leak proof container. The remaining solid waste may be disposed of as provided in "Solid Waste" of these Special Provisions.

10-1.05.4.4 NON-STORM WATER MANAGEMENT

Water Control and Conservation

The Contractor shall prevent erosion or the discharge of pollutants into storm drain systems or watercourses by managing the water used for construction operations. The Contractor shall obtain the Engineer's approval before washing anything on the construction site with water that could discharge into a storm drain system or watercourse. Discharges shall be reported to the Engineer immediately.

The Contractor shall implement water conservation practices when water is used on the construction site. Irrigation areas shall be inspected and watering schedules shall be adjusted to prevent erosion, excess watering, or runoff. The Contractor shall shut off the water source to broken lines, sprinklers, or valves, and they shall be repaired as soon as possible. When possible, water from waterline flushing shall be reused for landscape irrigation. Paved areas shall be swept and vacuumed, not washed with water.

Construction water runoff, including water from water line repair, shall be directed to areas to infiltrate into the ground and shall not be allowed to enter storm drain systems or watercourses. Spilled water shall not be allowed to escape water truck filling areas. When possible, the Contractor shall direct water from off-site sources around the construction site, or shall minimize contact with the construction site.
Illegal Connection and Discharge Detection and Reporting

The Contractor shall inspect the construction site and the site perimeter before beginning work for evidence of illegal connections, discharges, or dumping. Subsequently, the construction site and perimeter shall be inspected on a frequent, predetermined schedule.

The Contractor shall immediately notify the Engineer when illegal connections, discharges, or dumping are discovered. The Contractor shall take no further action unless directed by the Engineer. Unlabeled or unidentifiable material shall be assumed to be hazardous.

The Contractor shall look for the following evidence of illegal connections, discharges, or dumping:

A. Debris or trash piles,
B. Staining or discoloration on pavement or soils,
C. Pungent odors coming from drainage systems,
D. Discoloration or oily sheen on water,
E. Stains or residue in ditches, channels or drain boxes,
F. Abnormal water flow during dry weather,
G. Excessive sediment deposits,
H. Nonstandard drainage junction structures, or
I. Broken concrete or other disturbances near junction structures.

Vehicle and Equipment Cleaning

The Contractor shall limit vehicle and equipment cleaning or washing on the construction site to that necessary to control vehicle tracking or hazardous waste. Vehicles and equipment shall not be cleaned on the construction site with soap, solvents, or steam until the Engineer has been notified. The resulting waste shall be contained and recycled, or disposed of as provided in "Liquid Waste" or "Hazardous Waste" of these Special Provisions, whichever is applicable. The Contractor shall not use diesel to clean vehicles or equipment, and shall minimize the use of solvents.

The Contractor shall clean or wash vehicles and equipment in a structure equipped with disposal facilities. If using a structure is not possible, vehicles and equipment shall be cleaned or washed in an outside area with the following characteristics:

A. Located at least 50 feet from storm drainage systems or watercourses,
B. Paved with asphalt concrete or portland cement concrete,
C. Surrounded by a containment berm, and
D. Equipped with a sump to collect and dispose of wash water.

When washing vehicles or equipment with water, the Contractor shall use as little water as possible. Hoses shall be equipped with a positive shutoff valve.

Wash racks shall discharge to a recycle system or to another system approved by the Engineer. Sumps shall be inspected regularly, and liquids and sediments shall be removed as needed.

Vehicle and Equipment Fueling and Maintenance

The Contractor shall fuel or perform maintenance on vehicles and equipment off the construction site whenever practical. When fueling or maintenance must be done at the construction site, the Contractor shall designate a site, or sites, and obtain approval from the Engineer before using. The fueling or maintenance site shall be protected from storm water, shall be on level ground, and shall be located at least 50 feet from drainage inlets or watercourses. The CONTRACTOR shall inspect the fueling or maintenance site regularly. Mobile fueling or maintenance shall be kept to a minimum.

The Contractor shall use containment berms or dikes around the fueling and maintenance area. Adequate amounts of absorbent spill cleanup material and spill kits shall be kept in the fueling and maintenance area and on fueling trucks. Spill cleanup material and kits shall be disposed of immediately after use. Drip pans or absorbent pads shall be used during fueling or maintenance unless performed over an impermeable surface.

Fueling or maintenance operations shall not be left unattended. Fueling nozzles shall be equipped with an automatic shutoff control. Vapor recovery fueling nozzles shall be used where required by the Air Quality Management District. Nozzles shall be secured upright when not in use. Fuel tanks shall not be topped-off.

The Contractor shall recycle or properly dispose of used batteries and tires.
Material and Equipment Used Over Water

Drip pans and absorbent pads shall be placed under vehicles or equipment used over water, and an adequate supply of spill cleanup material shall be kept with the vehicle or equipment. Drip pans or plastic sheeting shall be placed under vehicles or equipment on docks, barges, or other surfaces over water when the vehicle or equipment will be idle for more than one hour.

The Contractor shall provide watertight curbs or toe boards on barges, platforms, docks, or other surfaces over water to contain material, debris, and tools. Material shall be secured to prevent spills or discharge into water due to wind.

Structure Removal Over or Adjacent to Water

The Contractor shall not allow demolished material to enter storm water systems or watercourses. The Contractor shall use covers and platforms approved by the Engineer to collect debris. Attachments shall be used on equipment to catch debris on small demolition operations. Debris catching devices shall be emptied regularly and debris shall be handled as provided in "Waste Management" of these Special Provisions.

The CONTRACTOR shall inspect demolition sites within 50 feet of storm water systems or watercourses every day.

Paving, Sealing, Sawcutting, and Grinding Operations

The Contractor shall prevent the following material from entering storm drain systems or water courses:

A. Cementitious material,
B. Asphaltic material,
C. Aggregate or screenings,
D. Grinding or sawcutting residue,
E. Pavement chunks, or
F. Shoulder backing.

The Contractor shall cover drainage inlets and use linear sediment barriers to protect downhill watercourses until paving, sealing, sawcutting, or grinding operations are completed and excess material has been removed. Drainage inlets and manholes shall be covered during the application of seal coat, tack coat, slurry seal, or fog seal.

During the rainy season or when precipitation is predicted, paving, sawcutting, and grinding operations shall be limited to places where runoff can be captured. Seal coat, tack coat, slurry seal, or fog seal operations shall not begin if precipitation is predicted for the application or the curing period. The Contractor shall not excavate material from existing roadways during precipitation.

The Contractor shall vacuum up slurry from sawcutting operations immediately after the slurry is produced. Slurry shall not be allowed to run onto lanes open to public traffic or off the pavement.

The Contractor shall collect residue from portland cement concrete grinding operations with a vacuum attachment on the grinding machine. The residue shall not be left on the pavement or allowed to flow across the pavement.

Material excavated from existing roadways may be stockpiled as provided in "Stockpile Management" of these Special Provisions if approved by the Engineer. Asphalt concrete chunks used in embankment shall be placed above the water table and covered by at least one foot of material.

Substances used to coat asphalt trucks and equipment shall not contain soap, foaming agents, or toxic chemicals.

Thermoplastic Striping and Pavement Markers

Thermoplastic striping and preheating equipment shutoff valves shall work properly at all times when on the construction site. The Contractor shall not preheat, transfer, or load thermoplastic within 50 feet of drainage inlets or watercourses. The Contractor shall not fill the preheating container to more than 6 inches from the top. Truck beds shall be cleaned daily of scraps or melted thermoplastic.

The Contractor shall not unload, transfer, or load bituminous material for pavement markers within 50 feet of drainage inlets or watercourses. All pressure shall be released from melting tanks before removing the lid to fill or service. Melting tanks shall not be filled to more than 6 inches from the top.

The Contractor shall collect bituminous material from the roadway after marker removal.
Pile Driving

The Contractor shall keep spill kits and cleanup material at pile driving locations. Pile driving equipment shall be parked over drip pans, absorbent pads, or plastic sheeting where possible. When not in use, pile driving equipment shall be stored at least 50 feet from concentrated flows of storm water, drainage courses, or inlets. The Contractor shall protect pile driving equipment by parking it on plywood and covering it with plastic when precipitation is predicted. The CONTRACTOR shall inspect the pile driving area every day for leaks and spills.

The Contractor shall use vegetable oil instead of hydraulic fluid when practical.

Concrete Curing

The Contractor shall not overspray chemical curing compound. Drift shall be minimized by spraying as close to the concrete as possible. Drainage inlets shall be covered before applying curing compound.

The Contractor shall minimize the use and discharge of water by using wet blankets or similar methods to maintain moisture when curing concrete.

Concrete Finishing

The Contractor shall collect and dispose of water and solid waste from high-pressure water blasting. Drainage inlets within 50 feet shall be covered before sandblasting. The nozzle shall be kept as close to the surface of the concrete as possible to minimize drift of dust and blast material. Blast residue may contain hazardous material.

Containment structures for concrete finishing operations shall be inspected for damage before each day of use and before predicted precipitation. Liquid and solid waste shall be removed from the containment structure after each work shift.

10-1.05.4.5 PAYMENT

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in spill prevention and control, material management, waste management, non-storm water management, and dewatering and identifying, sampling, testing, handling, and disposing of hazardous waste, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the contract prices paid for the items of work that require construction site management and no additional compensation will be allowed.

10-1.05.5 TEMPORARY CONCRETE WASHOUT FACILITY

Temporary concrete washout facilities shall be constructed, maintained, and later removed at the locations shown on the approved Storm Water Pollution Prevention Plan in conformance with "Water Pollution Control" of these Special Provisions, and in conformance with details shown on the plans and these Special Provisions.

Temporary concrete washout facilities shall be one of the water pollution control practices for waste management and materials pollution control. The Storm Water Pollution Prevention Plan shall include the use of temporary concrete washout facilities.

10-1.05.5.1 MATERIALS

Plastic Liner

Plastic liners shall be single ply, new polyethylene sheeting, a minimum of 10 mils thick and shall be free of holes, punctures, tears or other defects that compromise the impermeability of the material. Plastic liners shall not have seams or overlapping joints.

Gravel-filled Bags

Gravel bag fabric shall be non-woven polypropylene geotextile (or comparable polymer) and shall conform to the following requirements:
Gravel bags shall be between 24 inches and 32 inches in length, and between 16 inches and 20 inches in width.
Yarn used for binding gravel bags shall be as recommended by the manufacturer or bag supplier and shall be of a contrasting color.
Gravel shall be between 3/8 inch and ¾ inch in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials.
The opening of gravel-filled bags shall be secured to prevent gravel from escaping. Gravel-filled bags shall be between 30 pounds and 50 pounds in weight.

**Straw Bales**
Straw for straw bales shall conform to the provisions in Section 13-10.02H, "Straw Bales," of the Standard Specifications.
Straw bales shall be a minimum of 14 inches in width, 18 inches in height, 36 inches in length and shall have a minimum weight of 50 pounds. The straw bale shall be composed entirely of vegetative matter, except for binding material.
Straw bales shall be bound by either wire, nylon or polypropylene string. Jute or cotton binding shall not be used. Baling wire shall be a minimum of 16 gage in diameter. Nylon or polypropylene string shall be approximately 0.08-inch in diameter with 80 pounds of breaking strength.

**Stakes**
Stakes shall be wood or metal. Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots or other defects which would render them unfit for the purpose intended. Wood stakes shall be a minimum 2" x 2" in size. Metal stakes may be used as an alternative, and shall be a minimum of 0.5-inch in diameter. Stakes shall be a minimum of 4 feet in length. The tops of the metal stakes shall be bent at a 90-degree angle or capped with an orange or red plastic safety cap that fits snugly to the metal stake. The Contractor shall submit a sample of the metal stake and plastic cap, if used, for the Engineer's approval prior to installation.

**Staples**
Staples shall be as shown on the plans. An alternative attachment device such as geotextile pins or plastic pegs may be used instead of staples. The Contractor shall submit a sample of the alternative attachment device for the Engineer's approval prior to installation.

**Signs**
Plywood shall be freshly painted for each installation with not less than 2 applications of flat white paint. Sign letters shown on the plans shall be stenciled with commercial quality exterior black paint. Testing of paint will not be required.

**10-1.05.5.2 INSTALLATION**
Temporary concrete washout facilities shall be as follows:

A. Temporary concrete washout facilities shall be installed prior to beginning placement of concrete and located a minimum of 50 feet from storm drain inlets, open drainage facilities, and water courses unless determined infeasible by the Engineer. Temporary concrete washout facilities shall
be located away from construction traffic or access areas at a location determined by the Contractor and approved by the Engineer.

B. A sign shall be installed adjacent to each washout facility at a location determined by the Contractor and approved by the Engineer. Signs shall be installed in conformance with the provisions in Section 56-4.03, "Construction," and Section 56-4.03B, "Sign Panel Installation," of the Standard Specifications.

C. The length and width of a temporary concrete washout facility may be increased from the minimum dimensions shown on the plans, at the Contractor's expense and upon approval of the Engineer.

D. Temporary concrete washout facilities shall be constructed in sufficient quantity and size to contain liquid and concrete waste generated by washout operations for concrete wastes. These facilities shall be constructed to contain liquid and concrete waste without seepage, spills, or overflow.

E. Berms for below grade temporary concrete washout facilities shall be constructed from compacted native material. Gravel may be used in conjunction with compacted native material.

F. A plastic liner shall be installed in below grade temporary concrete washout facilities. Details for an alternative temporary concrete washout facility shall be submitted to the Engineer for approval at least 7 days prior to installation.

Temporary concrete washout facilities shall be disposed of in conformance with the provisions in Section 13-9, "Temporary Concrete Washouts," of the Standard Specifications.

Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary concrete washout facilities shall be backfilled and repaired in conformance with the provisions in Section 15, "Existing Facilities," of the Standard Specifications.

10-1.05.5.3 MAINTENANCE

Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with the provisions in Section 13-9, "Temporary Concrete Washouts," of the Standard Specifications. Holes, rips, and voids in the plastic liner shall be patched and repaired by taping or the plastic liner shall be replaced. The plastic liner shall be replaced when patches or repairs compromise the impermeability of the material as determined by the Engineer.

Gravel bags shall be replaced when the bag material is ruptured or when the yarn has failed, allowing the bag contents to spill out.

Temporary concrete washout facilities shall be repaired or replaced on the same day the damage occurs. Damage to temporary concrete washout facilities resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

10-1.05.5.4 PAYMENT

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing a temporary concrete washout facility, complete in place, including excavation and backfill, maintenance, and removal, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be included in the various items of work requiring concrete and no additional compensation will be allowed.

10-1.06 PROPERTY AND FACILITY PRESERVATION

Attention is directed to Section 5-1.36 "Property and Facility Preservation," of the Standard Specifications and these Special Provisions.

Existing trees, shrubs and other plants, that are not to be removed as shown on the plans or specified in these Special Provisions, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor. The minimum size of tree replacement shall be 24 inch box and the minimum size of shrub replacement shall be No. 15 container {15-gallon}. Replacement ground cover plants shall be from flats and shall be planted 12 inches on center. Replacement of Carpobrotus ground cover plants shall be from cuttings and shall be planted 12 inches on center. Replacement planting shall conform to the requirements in Section 20-7.03I(16), "Replacement Plants," of the Standard Specifications. The Contractor shall water replacement plants in conformance with the provisions in Section 20-7.03I(11), "Watering," of the Standard Specifications.
Damaged or injured plants shall be removed and disposed of outside the highway right of way in conformance with the provisions in 5-1.20B(4), "Contractor-Property Owner Agreement," of the Standard Specifications. At the option of the Contractor, removed trees and shrubs may be reduced to chips. The chipped material shall be spread within the highway right of way at locations designated by the Engineer.

Replacement planting of injured or damaged trees, shrubs, and other plants shall be completed prior to the start of the plant establishment period. Replacement planting shall conform to the provisions in Section 20-7, "Highway Planting," of the Standard Specifications.

Replacement planting of injured or damaged trees, shrubs, and other plants shall be completed not less than 20 working days prior to acceptance of the contract. Replacement plants shall be watered as necessary to maintain the plants in a healthy condition.

Survey monuments and markers shown on the plans or encountered within the project limits. The Contractor shall notify the Engineer of monuments encountered and shall not remove, disturb, or damage said monument until the monument can be cross-referenced and tied out by a licensed surveyor. The Contractor shall allow a minimum of one working day for such referencing to be accomplished. When notified by the Engineer that the ties have been completed, the monument or marker can then be removed. The Contractor is not responsible for the replacement of any monument or marker of which the removal is necessitated by the work performed and which has been referenced and tied. If through negligence or carelessness on the part of the Contractor, notification is not made as provided above, markers are removed, or disturbed which are not in direct conflict with the construction, the Contractor shall be responsible for the cost of referencing, resurveying, and replacement of the monument or marker. Such sums for the replacement shall be deducted from the final contract payment.

Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.07 COOPERATION

Attention is directed to Section 5-1.09, "Partnering," and Section 5-1.20, "Coordination with Other Entities," of the Standard Specifications and these Special Provisions.

Following is a list of some, but not necessarily all, of the utility companies that may have facilities in the project area:

<table>
<thead>
<tr>
<th>Utility Company</th>
<th>Contact Person</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific Gas &amp; Electric</td>
<td>Lee Wells</td>
<td>530-477-3254</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>Carol Prince</td>
<td>916-409-1384</td>
</tr>
<tr>
<td>Comcast Cable</td>
<td>Michael Benton</td>
<td>530-790-3369</td>
</tr>
<tr>
<td>City of Grass Valley – Sewer/Water/Storm Drain</td>
<td>Public Works Department</td>
<td>530-274-4350</td>
</tr>
</tbody>
</table>

The Contractor shall coordinate with Pacific Gas and Electric Company for the removal, relocation, repair, or disturbance of any gas or electric facilities caused by project work. Any utilities not listed above or damaged by the Contractor during the course of project work shall be repaired or replaced in cooperation with Pacific Gas and Electric Company.

The Contractor shall coordinate with the AT&T for the removal, relocation, repair, or disturbance of any telecommunications facilities caused by project work. Any utilities not listed above or damaged by the Contractor during the course of project work shall be repaired or replaced in cooperation with the AT&T.

The Contractor shall coordinate with the Comcast Cable for the removal, relocation, repair, or disturbance of any cable television facilities caused by project work. Any utilities not listed above or damaged by the Contractor during the course of project work shall be repaired or replaced in cooperation with the Comcast Cable.

The Contractor shall coordinate with the City of Grass Valley for the removal, relocation, repair, or disturbance of any water or sewer facilities caused by project work. Any utilities not listed above or damaged by the Contractor during the course of project work shall be repaired or replaced in cooperation with the City of Grass Valley.

The Contractor shall provide sufficient notification to the affected utility company to allow time for scheduling and completion of the required work. Any delays resulting from the Contractor’s failure to properly notify or schedule utility company work shall be at the Contractor’s expense.

Full compensation for conforming to the provisions of this section shall be considered as included in prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.08 PROGRESS SCHEDULE

Progress schedules are required for this contract and shall be submitted in conformance with the provisions in Section 8-1.02, "Schedule," of the Standard Specifications and these Special Provisions. The Contractor shall notify the Engineer on a daily basis of the areas of work scheduled for the following day.

The Contractor shall submit to the Engineer a practicable “Critical Path Method” progress schedule within 10 working days of approval of the contract, and within 10 working days of the Engineer’s written request at any other time.
The progress schedule shall follow the general order of work detailed in these Special Provisions, and shall meet the milestones listed in “Beginning of Work, Time of Completion, and Liquidated Damages,” of these Special Provisions.

Attention is directed to “Beginning of Work, Time of Completion, and Liquidated Damages” of these Special Provisions for time requirements of certain items of work. Specifically, due to a scheduled, significant public event, work necessary to complete “Asphalt Concrete Structural Section Replacement” and “Minor Concrete (Stamped Crosswalk)” shall be completed no later than May 10, 2015. The progress schedule shall show completion of these items of work in advance of this date, with necessary allowances for delays.

Full compensation for conforming to the provisions of this section shall be considered as included in prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.09 OBSTRUCTIONS

Attention is directed to Section 5-1.20, "Coordination with Other Entities," of the Standard Specifications and of these Special Provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: natural gas in pipelines underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths, water mains, gravity sanitary sewer lines, and telephone conduits.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Notification Center</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underground Service Alert – Northern California (USA)</td>
<td>1-800-227-2600</td>
</tr>
</tbody>
</table>

The Contractor is hereby notified that prior to commencing construction, he is responsible for contacting all utility companies for verification at the construction site of the locations of all underground facilities that may conflict with the placement of the improvements shown on the plans. Where potential conflict exists, the Contractor shall pothole existing utilities to determine their elevation. Call “Underground Service Alert” at 800-227-2600 forty-eight (48) hours before any excavation is started.

Full compensation for conforming to the provisions of this section, including exposing existing utilities, and any potholing, not otherwise provided for, shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.10 DUST CONTROL

Dust control shall conform to the provisions in Section 14-9.03, "Dust Control," of the Standard Specifications and these Special Provisions.

Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.11 MOBILIZATION

Mobilization shall conform to the provisions in the Standard Specifications and these Special Provisions.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in “Mobilization,” including but not limited to the movement of personnel, equipment, supplies and incidentals to the project site shall be included in the contract lump sum price paid for “Mobilization,” and no additional compensation will be allowed.

10-1.12 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

Flagging, signs, and temporary traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions.

Category 1 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices. These devices shall be certified as crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 temporary traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.
If requested by the Engineer, the Contractor shall provide written self-certification for crashworthiness of Category 1 temporary traffic control devices at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use. Self-certification shall be provided by the manufacturer or Contractor and shall include the following:

A. Date,
B. Federal Aid number (if applicable),
C. Contract number, district, county, route and post mile of project limits,
D. Company name of certifying vendor, street address, city, state and zip code,
E. Printed name, signature and title of certifying person; and
F. Category 1 temporary traffic control devices that will be used on the project.

The Contractor may obtain a standard form for self-certification from the Engineer.

Category 2 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices that are not expected to produce significant vehicular velocity change, but may cause potential harm to impacting vehicles. Category 2 temporary traffic control devices include barricades and portable sign supports.

Category 2 temporary traffic control devices shall be on the Federal Highway Administration's (FHWA) list of Acceptable Crashworthy Category 2 Hardware for Work Zones. This list is maintained by FHWA and can be located at: http://safety.fhwa.dot.gov/roadway_dept/roadハードware/listing.cfm?code=workzone.

The Department also maintains this list at: http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/Category2.pdf.

Category 2 temporary traffic control devices that have not received FHWA acceptance shall not be used. Category 2 temporary traffic control devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer. The label shall be readable and permanently affixed by the manufacturer.

Category 2 temporary traffic control devices without a label shall not be used.

If requested by the Engineer, the Contractor shall provide a written list of Category 2 temporary traffic control devices to be used on the project at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use.

Category 3 temporary traffic control devices consist of temporary traffic-handling equipment and devices that weigh 100 pounds or more and are expected to produce significant vehicular velocity change to impacting vehicles. Temporary traffic-handling equipment and devices include crash cushions, truck-mounted attenuators, temporary railing, temporary barrier, and end treatments for temporary railing and barrier.

Type III barricades may be used as sign supports if the barricades have been successfully crash tested, meeting the NCHRP Report 350 criteria, as one unit with a construction area sign attached.

Category 3 temporary traffic control devices shall be shown on the plans or on the Department's Highway Safety Features list. This list is maintained by the Division of Engineering Services and can be found at: http://www.dot.ca.gov/hq/esc/approved_products_list/HighwaySafe.htm.

Category 3 temporary traffic control devices that are not shown on the plans or not listed on the Department's Highway Safety Features list shall not be used.

Full compensation for providing self-certification for crashworthiness of Category 1 temporary traffic control devices and for providing a list of Category 2 temporary traffic control devices used on the project shall be considered as included in the prices paid for the various Contract items of work requiring the use of the Category 1 or Category 2 temporary traffic control devices and no additional compensation will be allowed.

10-1.13 CONSTRUCTION AREA SIGNS

Construction Area Signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions.

Attention is directed to the provisions in "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions. Type II retroreflective sheeting shall not be used on construction area sign panels. Type III, IV, VII, VIII, or IX retroreflective sheeting shall be used for stationary mounted construction area sign panels.

Orange background on construction area signs shall be fluorescent orange.

Repair to construction area sign panels will not be allowed, except when approved by the Engineer. At nighttime under vehicular headlight illumination, sign panels that exhibit irregular luminance, shadowing or dark blotches shall be immediately replaced at the Contractor's expense.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing excavation for construction area sign posts. The regional notification centers include, but are not limited to, the following:
Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes. The post hole diameter, if backfilled with portland cement concrete, shall be at least 4 inches greater than the longer dimension of the post cross section.

Construction area signs placed within 15 feet from the edge of the travel way shall be mounted on stationary mounted sign supports as specified in "Construction Area Traffic Control Devices" of these Special Provisions.

The Contractor shall maintain accurate information on construction area signs. Signs that are no longer required shall be immediately covered or removed. Signs that convey inaccurate information shall be immediately replaced or the information shall be corrected. Covers shall be replaced when they no longer cover the signs properly. The Contractor shall immediately restore to the original position and location any sign that is displaced or overturned, from any cause, during the progress of work.

The Contractor may be required to cover certain signs during the progress of the work. Signs that are no longer required or that convey inaccurate information to the public shall be immediately covered or removed or the information shall be corrected. Covers for construction area signs shall be of sufficient size and density to completely block out the complete face of the signs. The reflective face of the covered signs shall not be visible either during the day or at night. Covers shall be fastened securely so that the signs remain covered during inclement weather. Covers shall be replaced when they no longer cover the signs properly.

Construction Area Signs shown on the Contractor's accepted Traffic Control Plan, or as directed by the Engineer, shall be included in the Contract price paid for, "Traffic Control System," and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing construction area signs required for the direction of public traffic through or around the work and for erecting or placing, maintaining (including covering and uncovering as needed) and, when no longer required, removing construction area signs.

10-1.14 TEMPORARY OBJECT MARKERS

Object markers shall be stationary mounted on wood or metal posts in conformance with the details shown on the plans and the provisions in Section 85, “Pavement Markers,” of the Standard Specifications.

Marker panels for Type P object markers shall conform to the provisions for sign panels for stationary mounted signs.

Full compensation for furnishing, placing, maintaining, and removing temporary object markers, including but not limited to for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in Temporary Object Markers, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, as required per the Contractor’s accepted Traffic Control Plan, and as directed by the Engineer shall be considered as included in the Contract prices paid for the various items of work and no separate payment will be made.

10-1.15 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.03, "Public Convenience," 7-1.04, "Public Safety," and 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions. Nothing in these Special Provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.04, “Public Safety.”

Lane closures shall conform to the provisions in “Closure Requirements and Conditions,” and "Traffic Control System" of these Special Provisions.

The full width of the travel way shall remain open for public use at all times unless otherwise specified in these Special Provisions or approved by the Engineer.

The following traffic control restrictions shall be permitted or as otherwise approved by the Engineer:

- West Main Street, between South Auburn Street and School Street, may be closed with detours between the hours of 6:00pm and 7:00am, Monday through Friday for certain items of work including crosswalk construction and asphalt concrete replacement. (This does not relieve the Contractor from complying with sound control requirements of these Special Provisions)
- West Main Street between South Auburn Street and School Street, may be reduced to one way traffic with detours or two way stop control between the hours of 7:00am and 6:00pm, Monday through Friday with the following limitations:
  - Between the hours of 8:00am and 10:00am, west bound traffic will remain open to traffic
  - Between the hours of 3:00pm and 6:00pm, east bound traffic will remain open to traffic

Five days advance notice shall be given to all residents, businesses and local authorities prior to beginning work involving closures. The Contractor shall accommodate any special needs that arise that may require ingress and egress to a property.
The Contractor may request day and/or weekend hours of work, which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

The Contractor shall provide access to parking lots, driveways, residences and businesses at all times unless otherwise specified in these Special Provisions or approved by the City Engineer. Access to parking lots, driveways, and businesses within the project area shall be detailed in the Contractor’s Traffic Control Plan for review and acceptance by the Engineer. Five days advance notice shall be given to all residents, businesses and local authorities prior to beginning work involving temporary closures to driveways or parking lots.

Pedestrian access to all businesses within the project area shall be maintained at all times. Pedestrian detours shall be detailed on the Contractor’s Traffic Control Plan and may only redirect pedestrians around work areas using other sidewalks. Pedestrian detours shall only redirect pedestrians by one additional block at any one time. Staggering of sidewalk and curb ramp replacements will be necessary to ensure pedestrian access is maintained.

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

The Contractor shall notify local authorities of the Contractor's intent to begin work at least 7 days before work is begun. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make arrangements relative to keeping the working area clear of parked vehicles.

Whenever work vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a portable sign stand with flags. The sign shall be placed where designated by the Engineer and/or as required as part of the Contractor’s accepted Traffic Control Plan. The sign shall be a minimum of 48” x 48” in size. The Contractor shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane. The lane closure provisions of this section shall not apply if the work area is protected by a temporary railing or barrier.

Pedestrian and bicycle access facilities shall be provided through construction areas within the right of way, unless otherwise approved by the Engineer, and included in the Contractor’s Traffic Control Plan for review and acceptance by the Engineer.

In lieu of Section 12-1.03, “Flagging Costs” of the Standard Specifications, full compensation for all flagging costs required for contract items and work within the Project Limits shall be included in the contract price paid for “Traffic Control System” and no additional compensation will be allowed.

Full compensation for furnishing all signs, pedestrian and bicycle access facilities, posting signs, detours, lane closures, materials, tools, equipment, and/incidentals and for doing all work involved in “Maintaining Traffic” complete in place as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer will be included in the Contract lump sum price paid for “Traffic Control System” and no additional compensation will be allowed.

10-1.16  CLOSURE REQUIREMENTS AND CONDITIONS

Lane closures shall conform to the provisions in "Maintaining Traffic" of these Special Provisions and these Special Provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

10-1.16.1  CLOSURE SCHEDULE

By noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday noon through the following Friday noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall submit the Closure Schedule request in a form acceptable to the City for approval. Closure Schedules submitted to the Engineer with incomplete, unintelligible or inaccurate information will be returned for
correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Amendments to the Closure Schedule, including adding additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of a planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

The Contractor shall confirm, in writing, all scheduled closures by no later than 8:00 a.m. 3 working days prior to the date on which the closure is to be made. Approval or denial of scheduled closures will be made no later than 4:00 p.m. 2 working days prior to the date on which the closure is to be made. Closures not confirmed or approved will not be allowed.

Confirmed closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the following working day.

10-1.16.2  CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

10-1.16.3  LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.06, "Suspensions," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

For each 30-minute interval, or fraction thereof past the time specified to reopen the closure, the City will deduct $200 per interval from moneys due or that may become due the Contractor under the Contract.

10-1.16.4  PAYMENT

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, time or payment adjustments shall be determined in conformance with the provisions in Section 8-1.07 “Delays” of the Standard Specifications:

A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these Special Provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.

B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a delay and time or payment adjustments shall be determined in conformance with the provisions in Section 8-1.07 “Delays” of the Standard Specifications.

Full compensation for conforming to the provisions of this section shall be considered as included in the Contract lump sum price paid for “Traffic Control System,” and no additional compensation will be allowed.

10-1.17  TRAFFIC CONTROL SYSTEM

A traffic control system shall consist of closing traffic lanes in conformance with the details shown on the plans, the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications, the provisions in "Maintaining Traffic," “Closure Requirements and Conditions," and "Construction Area Signs," of these Special Provisions.

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

Any existing traffic stripes, pavement marking and pavement markers that are obliterated or removed by the Contractor or as directed by the Engineer shall be reinstalled by the Contractor before the completion of this project. Any conflicting markings shall be completely removed as identifiable pavement markings under daylight or at night, wet or dry conditions.
If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving lane closures. During other operations, traffic shall be controlled with stationary lane closures. Attention is directed to the provisions in Section 84-1.03B, "Protection From Damage," and Section 85-1.03, "Construction," of the Standard Specifications.

STATIONARY TYPE LANE CLOSURE: When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

Each vehicle used to place, maintain, and remove components of a traffic control system on multi lane highways shall be equipped with a Type II flashing arrow sign and radios which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining, and removing of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

When flaggers are required, they shall have radios and be in contact with personnel in the work area.

One-way traffic shall be controlled through the project in conformance with the Caltrans Standard Plan T-13, "Traffic Control System for Lane Closure on Two Lane Conventional Highways" and these Special Provisions.

MOVING LANE CLOSURE: Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to the provisions in Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 7 feet above the ground, but should be as high as practicable.

Flashing arrow signs shall be in the caution display mode when used on 2-lane, 2-way highways.

Truck-mounted attenuators (TMA) for use in moving lane closures shall be any of the following approved models, or equal:


1. Distributor (northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734

2. Distributor (southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, telephone (800) 222-8274

B. Cal T-001 Model 2 or Model 3, manufacturer and distributor: Hexcel Corporation, 1711 Dublin Boulevard, P.O. Box 3212, Dublin, CA 94568, telephone (925) 551-4900

C. Renco Rengard Model Nos. CAM 8-815 and RAM 8-815, manufacturer and distributor: Renco Inc., 1582 Pflugerville Loop Road, P.O. Box 730, Pflugerville, TX 78660-0730, telephone (800) 654-8182

Each TMA shall be individually identified with the manufacturer's name, address, TMA model number, and a specific serial number. The names and numbers shall each be a minimum ½ inch high and located on the left (street) side at the lower front corner. The TMA shall have a message next to the name and model number in ½ inch high letters which states, "The bottom of this TMA shall be ______ inches ± ______ inch above the ground at all points for proper impact performance." Any TMA which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMAs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMA in conformance with the standards established by the Transportation Laboratory.

Approvals for new TMA designs proposed as equal to the above approved models shall be in conformance with the procedures (including crash testing) established by the Transportation Laboratory. For information regarding submittal of new designs for evaluation contact: Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, California 95819.

New TMAs proposed as equal to approved TMAs or approved TMAs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory.
Contractor shall submit a traffic control plan to the Engineer for acceptance prior to beginning any construction activities. All such plans shall conform to Section 12, “Temporary Traffic Control,” of the Standard Specifications, the Manual of Traffic Control, and these Special Provisions.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications, will be paid for as a part of the extra work.

Full compensation for furnishing all labor (including flagging costs), materials (including signs, markings, and markers), tools, equipment, and incidentals and for doing all work involved in “Traffic Control System,” including, but not limited to, placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the accepted Traffic Control Plan, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the Contract lump sum price paid for “Traffic Control System,” and no additional compensation will be allowed.

Attention is directed to Sections 9-1.16, “Progress Payments,” and 9-1.17, “Payment After Contract Acceptance,” of the Standard Specifications and these Special Provisions. Payments for the contract item “Traffic Control System” will be made on the basis of the percent of work done on all items of work excluding the item for “Traffic Control System.”

The adjustment provisions in Section 4-1.05, "Changes and Extra Work," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.04, "Force Account," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

10-1.17.1 TRAFFIC CONTROL PLAN

The Traffic Control Plan for controlling the traffic and parking, including shoulder closures, detours and lane closures on City roadways, applicable bikeways, pedestrian facilities, and State Highways in conjunction with the work shall be submitted by the Contractor. The Traffic Control Plan shall be consistent with all specific site conditions and work conditions for this project.

Contractor shall submit three (3) copies of a proposed Traffic Control Plan to the City Engineer for review and comments no later than five (5) working days after the pre-construction conference. Construction shall not begin until the traffic control plan has been reviewed and accepted by the Public Works Director/City Engineer. The contractor shall allow five (5) working days for review by the City. If revisions are required, as determined by the Public Works Director/City Engineer, the Contractor shall revise and resubmit the Traffic Control Plan within five (5) calendar days of receipt of comments and shall allow five (5) working days for review of the revised traffic control plans. Upon acceptance of the Traffic Control Plan by the Public Works Director/City Engineer, three (3) additional copies of the traffic control plan, incorporating all the required changes, shall be submitted to the Public Works Director/City Engineer. Failure to submit an acceptable traffic control plan shall not in any way delay the start of the contract working days. The Traffic Control Plan shall be prepared and stamped by a Civil Engineer or Traffic Engineer licensed to practice engineering in the State of California. If the Contractor makes significant changes to the accepted Traffic Control Plan, these changes must also be prepared and stamped by a licensed Civil Engineer or Traffic Engineer.


The Traffic Control Plan shall be accepted by the Engineer prior to the start of construction. The Contractor shall not proceed with any construction until proper traffic control has been provided to the satisfaction of the Engineer. Failure to comply with any specification herein or with direction from the Engineer may result in work stopped until compliance is restored.

Any lost days due to improper traffic control will be charged against the Contractor’s allowable working days.

The Contractor's Traffic Control Plan shall include and detail pedestrian access facilities through the construction areas within the Project right of way in accordance with Section 12-4, "Maintaining Traffic" for review and acceptance by the Engineer.

The Traffic Control Plan shall include preparation of a plan for the work to be performed within the project limits including, but not limited to, all flagging, signs, portable message signs, barricades, temporary striping, cones, pedestrian access facilities and other incidentals associated with, but not limited to, the widening of the roadway, installation of signal poles and conduits and reconstruction of sidewalks.

Acceptance by the City Engineer of the submitted traffic control plan shall in no way relieve the Contractor of his responsibility for any and all safety requirements conforming to the Standard Specifications, these Special Provisions or others of any public authority having jurisdiction for the safety of persons and property, or to protect them from damage, injury or loss.
Full compensation for conforming to the provisions of this section shall be considered as included in the Contract lump sum price paid for “Traffic Control System,” and no additional compensation will be allowed.

10-1.18 FLAGGING COSTS

The first paragraph of Section 12-1.03, “Flagging Costs,” of the Standard Specifications is amended in its entirety to read as follows:

Full compensation for furnishing all flaggers, including transporting flaggers, and providing stands, towers, or lights for use of flaggers to provide for passage of public traffic through the work under the provisions in Sections 7-1.03, “Public Convenience,” and 7-1.04, “Public Safety,” of the Standard Specifications shall be considered as included in the Contract lump sum price paid for “Traffic Control System” and no additional compensation will be allowed.

10-1.19 PORTABLE FLASHING BEACONS

Portable flashing beacons conforming to the provisions in Section 12, “Temporary Traffic Control,” of the Standard Specifications shall be furnished, placed and maintained at the locations shown on the plans, as required per the Contractor’s accepted Traffic Control Plan and/or directed by the Engineer.

If flashing beacons are displaced or are not in an upright position, from any cause, during the progress of the work, the Contractor shall immediately repair or replace the flashing beacons in their original locations.

Full compensation for furnishing, placing, maintaining, and removing portable flashing beacons as required per the Contractor’s accepted Traffic Control Plan and as ordered by the Engineer shall be considered as included in the Contract prices paid for the items of work that require the portable flashing beacons and no separate payment will be made.

10-1.20 BARRICADES

Barricades shall be furnished, placed and maintained at the locations shown on the plans, specified in the Standard Specifications or in these Special Provisions or where designated by the Engineer. Barricades shall conform to the provisions in Section 12, “Temporary Traffic Control,” of the Standard Specifications and these Special Provisions.

Attention is directed to "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions regarding retroreflective sheeting for barricades.

Construction area sign and marker panels conforming to the provisions in Section 12-3.06, "Construction Area Signs," of the Standard Specifications shall be installed on barricades in a manner determined by the Engineer at the locations shown on the plans.

Sign panels for construction area signs and marker panels installed on barricades shall conform to the provisions in Section 12-3.06B(2), "Stationary-Mounted Signs," of the Standard Specifications.

Full compensation for furnishing all barricades, including, but not limited to installation, maintenance and removal, shall be considered as included in the Contract lump sum price paid for “Traffic Control System” and no additional compensation will be allowed.

10-1.21 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these Special Provisions. Nothing in these Special Provisions shall be construed as reducing the minimum standards specified in the California Manual of Uniform Traffic Control Devices (“CAMUTCD”), or as relieving the Contractor from the responsibilities specified in Section 7-1.04, "Public Safety," of the Standard Specifications.

10-1.21.1 GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic.

All work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic tape, including underlying adhesive, which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.
10-1.21.2 TEMPORARY LANELINE AND CENTERLINE DELINEATION

Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary raised pavement markers placed at longitudinal intervals of not more than 24 feet. The temporary raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions.

Temporary raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary raised pavement markers placed on longitudinal intervals of not more than 24 feet shall be used on lanes open to public traffic for a maximum of 14 days. Prior to the end of the 14 days, the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided at the Contractor's expense. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Where "no passing" centerline pavement delineation is obliterated, the following "no passing" zone signing shall be installed prior to opening the lanes to public traffic. W20-1 (ROAD WORK AHEAD) signs shall be installed from 1,000 feet to 2,000 feet in advance of "no passing" zones. R4-1 (DO NOT PASS) signs shall be installed at the beginning and at every 2,000-foot interval within "no passing" zones. For continuous zones longer than 2 miles, W7-3a or W71(CA) (NEXT _____ MILES) signs shall be installed beneath the W20-1 signs installed in advance of "no passing" zones. R4-2 (PASS WITH CARE) signs shall be installed at the end of "no passing" zones. The exact location of "no passing" zone signing will be as determined by the Engineer and shall be maintained in place until permanent "no passing" centerline pavement delineation has been applied. The signing for "no passing" zones shall be removed when no longer required for the direction of public traffic. The signing for "no passing" zones shall conform to the provisions in "Construction Area Signs" of these Special Provisions, except for payment.

10-1.21.3 TEMPORARY EDGELINE DELINEATION

On multilane roadways (freeways and expressways), whenever edgelines are obliterated and temporary pavement delineation to replace those edgelines is not shown on the plans, the edgeline delineation to be provided for those areas adjacent to lanes open to public traffic shall be as follows:

A. Temporary pavement delineation for right edgelines shall, at the option of the Contractor, consist of either solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, or traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 feet.

B. Temporary pavement delineation for left edgelines shall, at the option of the Contractor, consist of either solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 feet or temporary pavement markers placed at longitudinal intervals of not more than 6 feet. Temporary pavement markers used for temporary left edgeline delineation shall be one of the types of temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions.

Whenever edgelines are obliterated on roadways, the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 feet.

Traffic stripe (4-inch wide) placed for temporary edgeline delineation, which will require removal, shall consist of temporary removable construction grade striping and pavement marking tape listed in "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions, and shall conform to the requirements “Temporary Traffic Stripe” (Tape) of this Special Provision. Temporary removable construction grade striping and pavement marking tape when used shall be applied in conformance with the manufacturer's recommendations. Where removal of the 4-inch wide traffic stripe will not be required, painted traffic stripe conforming to the provisions of “Temporary Traffic Stripe (Paint)” of these Special Provisions may be used. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement
delineation for edgelines, the Contractor shall provide personnel to remain at the project site to maintain the cones or delineators during hours of the day that the cones or delineators are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these Special Provisions, except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types 36 inches listed in Section 8-1.03, "Pre-qualified and Tested Signing and Delineation Materials," of these Special Provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

10-1.21.4 TEMPORARY TRAFFIC STRIPE (TAPE)

Temporary traffic stripe consisting of removable traffic stripe tape shall be applied at the locations shown on the Contractor’s accepting Traffic Control Plans, the project plans, and as directed by the engineer. The temporary traffic stripe tape shall be complete in place at the location shown prior to opening the traveled way to public traffic.

Removable traffic stripe tape shall be the temporary removable traffic stripe tape listed in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions.

Removable traffic stripe tape shall be applied in conformance with the manufacturer’s installation instructions and shall be rolled slowly with a rubber tired vehicle or roller to ensure complete contact with the pavement surface. Traffic stripe tape shall be applied straight on tangent alignment and on a true arc on curved alignment. Traffic stripe tape shall not be applied when the air or pavement temperature is less than 50°F, unless the installation procedures to be used are approved by the Engineer, prior to beginning installation of the tape.

When removable traffic stripe tape is specified for temporary left edgeline delineation, temporary pavement markers placed at longitudinal intervals of not more than 6 feet may be used in place of the temporary traffic stripe tape. Temporary pavement markers shall be one of the types of temporary pavement markers listed for long term day/night use (6 months or less) in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions. When temporary pavement markers are used in place of temporary tape traffic stripe, payment for those temporary pavement markers will be made on the basis of the theoretical length of the temporary traffic stripe (tape) required for the left edgeline which the temporary markers replace.

10-1.21.5 TEMPORARY TRAFFIC STRIPE (PAINT)

Temporary traffic stripe consisting of painted traffic stripe shall be applied and maintained at the locations shown on the Contractor’s accepted Traffic Control Plans, the project plans, and as directed by the Engineer. The painted temporary traffic stripe shall be complete in place at the location shown prior to opening the traveled way to public traffic. Removal of painted temporary traffic stripe will not be required.

Temporary painted traffic stripe shall conform to the provisions in “Paint Traffic Stripes and Pavement Markings” of these Special Provisions, Section 84-3, “Painted Traffic Stripes and Pavement Markings,” of the Standard Specifications, except for payment. At the option of the Contractor, either one or two coats shall be applied regardless of whether on new or existing pavement.

When painted traffic stripe is specified for temporary left edgeline delineation, temporary pavement markers placed at longitudinal intervals of not more than 6 feet may be used in place of the temporary painted traffic stripe. Temporary pavement markers will be one of the types of temporary pavement markers listed for long term day/night use (6 months or less) in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions. When temporary reflective pavement markers are used in place of temporary painted traffic stripe, payment for those temporary pavement markers will be made on the basis of the theoretical quantity of temporary traffic stripe (paint) required for the left edgeline the temporary pavement markers replace.

10-1.21.6 TEMPORARY PAVEMENT MARKING (TAPE)

Temporary pavement marking consisting of removable pavement marking tape shall be applied at the locations shown on the plans. The temporary pavement marking tape shall be complete in place at the location shown, prior to opening the traveled way to public traffic.

Removable pavement marking tape shall be the temporary removable type pavement marking tape listed in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions and shall be applied and removed in conformance with the provisions specified for applying and removing the temporary traffic stripe tape.

10-1.21.7 TEMPORARY PAVEMENT MARKING (PAINT)

Temporary pavement marking consisting of painted pavement marking shall be applied and maintained at the locations shown on the plans. The painted temporary pavement marking shall be complete in place at the location
shown prior to opening the traveled way to public traffic. Removal of painted temporary pavement marking will not be required.

Temporary painted pavement marking shall conform to the provisions in Section 84-3, “Paint Traffic Stripes and Pavement Markings,” of the Standard Specifications, except for payment. At the option of the Contractor, either one or 2 coats shall be applied regardless whether on new or existing pavement.

At the Contractor’s option, temporary removable pavement marking tape or permanent pavement marking tape listed in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions may be used instead of painted temporary pavement markings. When pavement marking tape is used, regardless of which type of tape is placed, the tape will be measured and paid for by the square meter as temporary pavement marking (paint).

10-1.21.8 TEMPORARY PAVEMENT MARKERS

Temporary pavement markers shall be applied at the location shown on the Contractor’s accepted traffic control plan, the project plans and as directed by the Engineer. The pavement markers shall be applied complete in place at the locations shown prior to opening the traveled way to public traffic.

Temporary pavement markers shown on the plans shall be, at the option of the Contractor, one of the temporary pavement markers for long term day/night use (6 months or less) listed in “Pre-qualified and Tested Signing and Delineation Materials” of these Special Provisions.

Temporary pavement markers shall be placed in conformance with the manufacturer’s instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used in areas where removal of the pavement markers will be required.

Where the temporary pavement delineation shown on the plans for lane lines or centerlines consists entirely of a pattern of broken traffic stripe and pavement markers, the Contractor may use groups of the temporary pavement markers for long term day/night use (6 months or less) in place of the temporary traffic stripe tape or painted temporary traffic stripe. The groups of pavement markers shall be spaced as shown on the plans for a similar pattern of permanent traffic line, except pavement markers shown to be placed in the gap between the broken traffic stripe shall be placed as part of the group to delineate the pattern of broken temporary traffic stripe. The kind of lane line and centerline delineation selected by the Contractor shall be continuous within a given location. Payment for those temporary pavement markers used in place of temporary traffic stripe will be made on the basis of the theoretical length of patterns of temporary traffic stripe (tape) or temporary traffic stripe (paint).

Retroreflective pavement markers conforming to the provisions in “Pavement Markers” of these Special Provisions may be used in place of temporary pavement markers for long term day/night use (6 months or less) except to simulate patterns of broken traffic stripe. Placement of the retroreflective pavement markers used for temporary pavement markers shall conform to the provisions in “Pavement Markers” of these Special Provisions except the waiting period provisions before placing the pavement markers on new asphalt concrete surfacing as specified in Section 85-1.03c, “Epoxy Adhesive,” of the Standard Specifications shall not apply and epoxy adhesive shall not be used to place pavement markers in areas where removal of the pavement markers will be required.

10-1.21.9 MEASUREMENT AND PAYMENT

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers and stripes, and/or layout (dribble) lines to establish alignment of temporary pavement markers used for temporary lane line and centerline delineation (including the signing specified for “no passing” zones) and for providing equivalent patterns of permanent traffic lines for these areas when required shall be considered as included in the contract price paid for “Traffic Control System” and no additional compensation will be allowed.

Full compensation for furnishing, placing, maintaining and removing temporary pavement delineation, including but not limited to, all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying, maintaining, removing, and repairing temporary pavement delineation, complete in place, as shown on the plans, as shown on the Contractor’s accepted Traffic Control Plan, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the Contract lump sum price paid for “Traffic Control System,” and no separate payment will be made.

10-1.22 TEMPORARY RAILING

Temporary railing (Type K) shall be placed at the locations shown on the Contractor's accepted Traffic Control Plan or as shown on the plans, and shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Pre-qualified and Tested Signing and Delineation Materials," of these Special Provisions.

The Contractor's attention is directed to the provisions in "Public Safety" of these Special Provisions.
Temporary railing (Type K) placed in accordance with the provisions in "Public Safety," of these Special Provisions will not be measured nor paid for.

Full compensation for furnishing all labor, materials (including reinforcement and concrete anchorage devices and terminal sections as required), excavation, backfill, tools, equipment and all incidentals, and for doing all work involved in furnishing, placing, maintaining, repairing, moving, reinstalling at a new location, replacing and removing temporary railing as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the Contract lump sum price paid for “Traffic Control System,” and no separate payment will be made.

10-1.23 CHANNELIZERS

Channelizers shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions.

Channelizers shall conform to the provisions in "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions.

When no longer required for the work as determined by the Engineer, channelizers and underlying adhesive used to cement the channelizer bases to the pavement shall be removed. Removed channelizers and adhesive shall become the property of the Contractor and shall be removed from the site of work.

Channelizers placed in accordance with the Contractor’s accepted Traffic Control Plan as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the Contract lump sum price paid for, "Traffic Control System" and no additional compensation will be allowed.

10-1.24 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these Special Provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these Special Provisions.

Attention is directed to "Public Safety", and "Temporary Railing" of these Special Provisions.

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 15 feet or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or TrafFix Sand Barrels manufactured after March 31, 1997, or equal:

A. Energite III and Fitch Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, telephone (312) 467-6750, FAX (800) 770-6755
   1. Distributor (North): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734
   2. Distributor (South): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, telephone (800) 222-8274, FAX (714) 937-1070

B. TrafFix Sand Barrels, manufactured by TrafFix Devices, Inc., 220 Calle Pintoresco, San Clemente, CA 92672, telephone (949) 361-5663, FAX (949) 361-9205
   1. Distributor (North): United Rentals, Inc., 1533 Berger Drive, San Jose, CA 95112, telephone (408) 287-4303, FAX (408) 287-1929
   2. Distributor (South): Statewide Safety & Sign, Inc., P.O. Box 1440, Pismo Beach, CA 93448, telephone (800) 559-7080, FAX (805) 929-5786

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.
Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in pounds for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 12 feet of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these Special Provisions and modules placed in excess of the number specified or shown will not be measured nor paid for.

Repairing modules damaged by public traffic will be paid for as extra work as provided in Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications. Modules damaged beyond repair by public traffic, when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Modules replaced due to damage by public traffic will be paid for as extra work as provided in Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications and these temporary crash cushion modules will not be counted for payment in the new position.

If the Engineer orders a lateral move of the sand filled temporary crash cushions, except those placed in conformance with “Public Safety,” of these Special Provisions, and the repositioning is not shown on the plans or the Contractor’s accepted Traffic Control Plan, moving the sand filled temporary crash cushion will be paid for as extra work as provided in Section 4-1.05, “Changes and Extra Work,” of the Standard Specifications and these temporary crash cushion modules will not be counted for payment in the new position.

Temporary crash cushion modules as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the Contract lump sum price paid for, "Traffic Control System,” and shall include full compensation for furnishing all labor, materials (sand, pallets or frames and marker panels), tools, equipment, and incidentals, and for doing all work involved in installing, maintaining, moving, resetting and removing, when no longer required (including those damaged by public traffic) the temporary crash cushion modules and no additional compensation will be allowed.

10-1.25 DEMOLITION AND REMOVAL

This work shall consist of removing existing facilities and structures which interfere with construction in the specified work area as shown on the plans and as specified in these Special Provisions. Attention is directed to Section 15, “Existing Facilities” of the Standard Specifications and these Special Provisions.

10-1.25.1 REMOVE ASPHALT CONCRETE

Existing asphalt concrete surfacing, and underlying base material shall be removed as needed, as shown on the plans and in conformance with these Special Provisions.

Attention is directed to the provisions in “Clearing and Grubbing,” and “Buried Man-Made Objects,” of the Standard Specifications and these Special Provisions.

That portion of the asphalt concrete area to be removed abutting asphalt concrete to remain in place shall be cut on neat lines with a power-driven saw before removing the surfacing, unless approved by the Engineer.

Surfacing and base shall be removed without damage to surfacing that is to remain in place. Damage to pavement which is to remain in place shall be repaired to a condition satisfactory to the Engineer or the damaged pavement shall be removed and replaced with new asphalt concrete if ordered by the Engineer. Repairing or removing and replacing pavement damaged outside the limits of pavement to be replaced shall be at the Contractor's expense and will not be measured nor paid for.

Removed materials shall be disposed of outside the highway right of way.

The material remaining in place, after removing surfacing and base to the required depth, shall be graded to a plane, watered, and compacted as deemed necessary by the Engineer.

Areas of the base material which are low as a result of over excavation shall be filled, at the Contractor's expense, with asphalt concrete.
The exact limits of asphalt concrete surfacing to be removed and replaced, as shown on the plans, will be determined by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing asphalt concrete, including, but not limited to, sawcutting, disposal, excavation and backfill as shown on the plans, as specified in the Standard Specifications and these Special Provisions and as directed by the Engineer, shall be included in the contract lump sum paid for “Demolition and Removal” and no additional compensation will be allowed.

10-1.25.2 REMOVE CONCRETE

Existing concrete, shown on the plans to be removed shall be completely removed and disposed of in accordance with Section 15-3, "Concrete Removal" of the Standard Specifications and these Special Provisions.

Attention is directed to the provisions in “Clearing and Grubbing,” and “Buried Man-Made Objects,” of the Standard Specifications and these Special Provisions.

Adjacent facilities damaged during concrete removal shall be repaired to a condition satisfactory to the Engineer or shall be removed and replaced if ordered by the Engineer. Repairing or removing and replacing damaged facilities shall be at the Contractor's expense and no additional compensation will be allowed. Attention is directed to hand stacked granite walls that may abut portions of the concrete to be removed. Care shall be taken in sawcutting and working next these walls and any damage to the walls shall be repaired at the Contractor’s expense.

Where concrete adjacent to stone retaining walls is to be removed, the concrete must be saw cut 6 inches from the wall or the base of the curb perpendicular to the street. The concrete can then be removed using hand tools in order to eliminate the potential for damage to the stone retaining walls.

Concrete shall be completely removed and disposed of outside the highway right of way.

Depressions left after concrete removal shall be immediately backfilled with sand cement slurry or Class 2 Aggregate Base and compacted sufficiently to obtain an unyielding surface.

Concrete shall be completely removed and disposed of outside the highway right of way.

Removal of concrete shall include removal of sidewalks, curbs, gutters, borders and miscellaneous concrete areas as shown on the plans to be removed.

Reinforcing or other steel may be encountered in portions of the concrete. No additional compensation will be allowed for the removal of concrete containing reinforcing or steel.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved including, but not limited to, sawcutting, disposal, excavation and backfill as shown on the plans, as specified the Standard Specifications and these Special Provisions and as directed by the Engineer, shall be included in the contract lump sum paid for “Demolition and Removal” and no additional compensation will be allowed.

10-1.25.3 REMOVE AND SALVAGE SIGN

Existing signs, posts and sign hardware, shown on the plans to be removed shall be carefully removed and salvaged in accordance with the requirements of the Standard Specifications and these Special Provisions.

Concrete footings for signs, and sign posts deemed unusable by the Engineer, shall be removed and disposed of outside the highway right of way in accordance with the provisions of the Standard Specifications, the project plans and these Special Provisions.

Signs, sign hardware and salvageable posts shall be delivered to the City’s corporation yard at 556 Freeman Lane.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in sign removal, including, but not limited to removal, salvaging, excavation, hauling and disposal, and backfilling, as shown on the plans, as specified in the Standard Specifications and these Special Provisions and as directed by the Engineer, shall be included in the contract lump sum paid for “Demolition and Removal” and no additional compensation will be allowed.

10-1.25.4 REMOVE AND/OR SALVAGE MISCELLANEOUS ITEMS

Miscellaneous items to be removed or salvaged, including, but not limited to valve boxes, sprinklers, posts and signs will be completely removed and disposed of or salvaged for re-use as directed by the Engineer. No separate payment shall be made for the miscellaneous items to be removed unless specified and listed in the Bid Schedule. Such items shall be included in the contract lump sum price paid for “Demolition and Removal” and no additional compensation will be allowed.

10-1.26 WATERING

Watering shall conform to the provisions in Section 17, "Watering," of the Standard Specifications and these Special Provisions.
Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.

10-1.27 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

Surplus excavated material shall become the property of the Contractor and shall be disposed of in conformance with the provisions in "Contractor-Property Owner Agreement," of the Standard Specifications.

The Contractor’s attention is directed to “Surplus Material,” and “Deficiency Material,” of the Standard Specifications.

Where a portion of the existing pavement surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 0.25-foot before removing the surfacing. If sawcut pavement is damaged before paving, it is the Contractor’s responsibility, at his expense, to re-cut and remove any damaged portion before paving. Full compensation for cutting the existing surfacing shall be considered as included in the various contract items of work involved and no additional compensation will be allowed.

Graded areas shall be watered and compacted in accordance with the Standard Specifications, City Improvement Standards and as directed by the Engineer. Subbase sections for sidewalk, curb ramps, curb and gutter, driveways, roadway shoulders and asphalt concrete pavement shall be compacted to 95% relative compaction to a minimum depth of six inches.

10-1.27.1 ROADWAY EXCAVATION

Roadway excavation shall conform to the provisions in Section 19-2, "Roadway Excavation," of the Standard Specifications and shall include all work associated with grading for the roadway improvements, grading for sidewalk, curb, gutter and curb ramps, grading earth ditches, and the grading to provide smooth transitions for conform areas.

In addition to the provisions of the Standard Specifications, roadway excavation shall include excavation, grading, and embankment construction necessary to construct roadway widening and sidewalk subgrades, vegetated swales, and slopes, in accordance with the requirements of Section 19, “Earthwork,” of the Standard Specifications and these Special Provisions.

Relative compaction of subgrade shall conform to all the provisions in Section 19-5 "Compaction" of the Standard Specifications. Payment for compaction of earthwork shall be considered as included in the various items of work requiring compaction and no additional compensation will be allowed.

If the Contractor elects to excavate and replace subgrade/base material to facilitate compaction, full compensation for that work will be considered as included in the contract item of work requiring the compaction of earthwork and no separate payment will be made.

Removed materials shall be properly disposed of outside the highway right of way unless otherwise designated on the plans or approved by the Engineer.

The material remaining in place, after removing surfacing and base to the required depth, shall be graded to a plane, watered, and compacted.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved including, but not limited to, excavation, stockpiling, loading, transporting, compacting, disposal, and all grading as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as various contract items of work requiring roadway excavation and no additional compensation will be allowed.

10-1.27.2 TEMPORARY SHORING

Temporary shoring will be necessary for any work required where the required excavation/trenching exceeds 5 feet in depth. If excavation/trenching exceeds 5 feet in depth, the Contractor shall be responsible for the design, installation, and maintenance of the temporary shoring system. The temporary shoring system shall be prepared and signed by an engineer who is registered as a Civil Engineer with the State of California.


All bracing and shoring shall comply with rules, orders and regulations of the California Division of Industrial Safety (D.I.S.). Trenching less than 5 feet in depth will require the Contractor to secure the appropriate D.I.S. permit and evidence of said permit shall be provided to the Engineer upon request.

The Contractor shall submit three (3) copies of the proposed temporary shoring system plan to the engineer a minimum of five (5) working days prior to the pre-construction conference. If excavation/trenching exceeds 5 feet in depth, the contractor shall not start construction of items of work requiring shoring before the temporary shoring plan has been reviewed and accepted by the Engineer.
The Contractor shall allow five (5) working days for the Engineer’s review. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the temporary shoring system plan within five (5) calendar days of receipt of the Engineer’s comments and shall allow five (5) working days for the Engineer to review the revisions. Upon acceptance of the temporary shoring system plan by the Engineer, three (3) additional copies of the temporary shoring system plan, incorporating all the required changes, shall be submitted to the Engineer. Failure to submit an acceptable temporary shoring system plan shall not in any way delay the start of the contract working days. If the Contractor makes significant changes to the accepted temporary shoring system plan, these changes must also be prepared and stamped by a licensed Civil Engineer.

Full compensation for temporary shoring, temporary shoring plans, for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in “Temporary Shoring,” complete in place, as shown on the Contractor’s accepted temporary shoring system, as shown on the plans, as specified in these Special Provisions and as directed by the Engineer shall be considered as included in the various contract items of work requiring the excavation or trenching exceeding 5 feet and no additional compensation will be allowed.

10-1.28 AGGREGATE BASE

Aggregate base shall be Class 2, (3/4 inch) maximum grading, and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these Special Provisions. Aggregate Base shall be processed to 95% relative compaction.

Do not store reclaimed asphalt concrete or aggregate base with reclaimed asphalt concrete within 100 feet measured horizontally of any culvert, watercourse, or bridge.

Aggregate base shall not contain volcanic cinder material.

Aggregate base shall have at least 80% of the rock having two or more fractured surfaces evident.

Aggregate base shall be placed to the lines, dimensions, and grades shown on the Plans or as directed by the Engineer.

Where existing aggregate base is shown on the plans to be remain in place, the material shall be sufficiently watered and compacted to obtain an unyielding surface, to the relative compaction as shown on the plans. If the existing base material is found to be unsuitable, in the opinion of the Engineer, it shall be replaced with new aggregate base in conformance with the provisions and payment details of this section. Payment for compaction of existing base to remain in place shall be considered as included in the various contract items of work requiring the compaction and no additional compensation will be allowed.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the installation of aggregate base, including, but not limited to, placing, grading, excavating, and compacting aggregate base as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the various contract items of work requiring aggregate base and no additional compensation will be allowed.

10-1.29 HOT MIX ASPHALT (HMA)

Hot Mix Asphalt (HMA) shall be a high stability mix, Type C, installed using the Standard Construction Process, and shall conform to the provisions in Section 39, "Hot Mix Asphalt," of the Standard Specifications and these Special Provisions.

The grade of asphalt binder to be mixed with aggregate for Type C HMA shall be PG 64-28PM conforming to the provisions in Section 92, "Asphalts," of the Standard Specifications.

Aggregate used for Type C HMA shall conform to the 1/2 inch maximum grading specified in Section 39-1.02E, "Aggregate," of the Standard Specifications for all structural section replacement areas, as designated on the plans.

The asphalt content of the asphalt mixture will be determined in conformance with the requirements in California Test 379, or in conformance with the requirements in California Test 382.

Paint binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of HMA, except when eliminated by the Engineer, and shall be applied to all vertical surfaces of existing pavement, curb and gutter, and construction joints in the surfacing against which additional material is to be placed and to other surfaces as designated by the Engineer.

Paint binder (tack coat) shall be paving asphalt conforming to the provisions in Section 39-1.02B, "Tack Coat," and Section 92, "Asphalts," of the Standard Specifications. The grade of paving asphalt to be used as paint binder will be determined by the Engineer.

Paint binder (tack coat) shall be applied in the gallon per square yard range limits specified for the surfaces to receive asphalt concrete in the tables below. The exact application rate within the range will be determined by the Engineer.
HMA shall be spread and compacted in the number of layers of the thicknesses indicated in the following table:

<table>
<thead>
<tr>
<th>Total Thickness Shown on Plans</th>
<th>No. of Layers</th>
<th>Top Layer Thickness (foot)</th>
<th>Next Lower Layer Thickness (foot)</th>
<th>All Other Lower Layer Thickness (foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.20-foot or less</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>0.25-foot</td>
<td>2b</td>
<td>0.12</td>
<td>0.13</td>
<td>0.12</td>
</tr>
<tr>
<td>0.30-0.40 foot</td>
<td>2</td>
<td>0.15</td>
<td>0.20</td>
<td>0.15</td>
</tr>
<tr>
<td>0.45-foot or more</td>
<td>c</td>
<td>0.15</td>
<td>0.20</td>
<td>0.15</td>
</tr>
</tbody>
</table>

a. When pavement reinforcing fabric is shown to be placed between layers of HMA, the thickness of asphalt concrete above the pavement reinforcing fabric shall be considered to be the "Total Thickness Shown on Plans" for the purpose of spreading and compacting the HMA above the pavement reinforcing fabric.

b. At the option of the Contractor, one layer 0.25-foot thick may be placed.

c. At least 2 layers shall be placed if total thickness is 0.45-foot. At least 3 layers shall be placed if total thickness is more than 0.45-foot and less than 0.90-foot. At least 4 layers shall be placed if total thickness is 0.90-foot or more.

HMA base shall be spread and compacted in one or more layers. Each layer of HMA base shall be not less than 0.20-foot nor more than 0.40-foot in compacted thickness, except that where the total thickness of HMA to be placed over HMA base is 0.20-foot or less, the layer of HMA base below the HMA shall not exceed 0.25-foot.

A layer shall not be placed over a layer which exceeds 0.25-foot in compacted thickness until the temperature of the layer which exceeds 0.25-foot in compacted thickness is less than 160° F at mid depth.

HMA shall be placed to the lines, dimensions, and grades shown on the plans or as directed by the Engineer. No allowance will be made for HMA placed outside those dimensions unless otherwise ordered by the Engineer. Areas of the base material which are low as a result of over excavation shall be filled, at the Contractor's expense, with HMA.

Full compensation for furnishing all labor, materials (including asphaltic emulsions, liquid asphalts, asphalts, and aggregate), tools, equipment, and incidentals, and for performing all the work involved in placing hot mix asphalt, complete in place including sawcutting existing asphalt concrete, and application of prime coat or paint binder (tack coat) as shown on the Plans, as specified in these Special Provisions, and as directed by the Engineer, shall be considered as included in the various contract items requiring HMA and no additional compensation will be allowed.

10-1.30 ASPHALT CONCRETE STRUCTURAL SECTION REPLACEMENT

This work shall consist of removing existing asphalt concrete surfacing, underlying pavement fabric and base material as needed, and replacing the removed structural section with new hot mix asphalt as shown on the plans and in conformance with these Special Provisions.

Attention is directed to “Beginning of Work, Time of Completion, and Liquidated Damages” of these Special Provisions for time requirements related to asphalt concrete replacement. Specifically, due to a scheduled, significant public event, work necessary to complete “Asphalt Concrete Structural Section Replacement” shall be completed no later than May 10, 2015.

Existing asphalt concrete surfacing and underlying base material removed during a work period shall be replaced before the time the lane is to be opened to public traffic in conformance with the provisions in "Maintaining Traffic" of these special provisions, unless approved by the Engineer.

The outline of the asphalt concrete area to be removed shall be cut on neat lines with a power-driven saw to a depth matching the depth of the replacement section, before removing the surfacing, unless approved by the Engineer. If the asphalt concrete surface is to be totally removed by cold planning, the Engineer may eliminate the saw-cutting before removing the surface.

Surfacing and base shall be removed without damage to surfacing that is to remain in place. Damage to pavement which is to remain in place shall be repaired to a condition satisfactory to the Engineer or the damaged pavement shall be removed and replaced with new asphalt concrete if ordered by the Engineer. Repairing or removing and replacing pavement damaged outside the limits of pavement to be replaced shall be at the Contractor's expense and will not be measured nor paid for.

Removed materials shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.
The material remaining in place, after removing surfacing and base to the required depth, shall be graded to a plane, watered, and compacted. The finished surface of the remaining material shall not extend above the grade established by the Engineer.

Hot mix asphalt shall be placed over the prepared base material or underlying asphalt concrete pavement not removed and shall conform to the provisions for asphalt concrete in "Hot Mix Asphalt" of these special provisions except for payment.

The exact limits of asphalt concrete surfacing to be removed and replaced, as shown on the plans, will be determined by the Engineer. The quantity of asphalt concrete structural section replacement to be paid for will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any change ordered by the Engineer.

The contract price paid per square yard for “Asphalt Concrete Structural Section Replacement (Type, depth of removal)” shall include full compensation for furnishing all labor, materials (including hot mix asphalt and aggregate base where shown), tools, equipment, and incidentals, and for doing all the work involved in replacing asphalt concrete surfacing, including sawcutting existing asphalt concrete, replacing and/or compacting underlying base material, application of tack coat and placing, leveling and compacting hot mix asphalt, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.31 MINOR CONCRETE

Concrete sidewalk, curb, gutters, curb ramps, crosswalks, medians and other minor concrete shown on the plans shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications and these Special Provisions. The Contractors attention is directed to Section 52 “Reinforcement” of the Standard Specifications and these Special Provisions for requirements regarding reinforcement bars as shown on the plans.

Attention is directed to “Beginning of Work, Time of Completion, and Liquidated Damages” of these Special Provisions for time requirements related minor concrete work. Specifically, due to a scheduled, significant public event, work necessary to complete “Minor Concrete (Stamped Crosswalk)” shall be completed no later than May 10, 2015.

All concrete surfaces shall be broom finished unless specified as stamped concrete. Surfaces to be used by pedestrian traffic shall be broomed transversely to the line of traffic.

Aggregate for minor concrete (textured paving) shall conform to the grading specified for fine aggregate in Section 90-3.03, "Fine Aggregate Grading," of the Standard Specifications. Aggregate for grout shall conform to the following grading:

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<tr>
<th>Sieve Sizes</th>
<th>Percentage Passing</th>
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<tr>
<td>No. 4</td>
<td>100</td>
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<tr>
<td>No. 8</td>
<td>90 – 100</td>
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<tr>
<td>No. 16</td>
<td>60 – 100</td>
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<tr>
<td>No. 30</td>
<td>35 – 70</td>
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<tr>
<td>No. 50</td>
<td>15 – 35</td>
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<tr>
<td>No. 100</td>
<td>2 – 15</td>
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Concrete for all minor concrete work shall be “six sack” concrete properly prepared at a mixing plant. Concrete shall be placed at the locations shown on the plans, struck off and compacted until a layer of mortar is brought to the surface. The concrete shall be screeded to the required grade and cross section and floated to a uniform surface.

Whenever new concrete curb, gutter and sidewalk adjoins existing, the existing concrete vertical face shall be doweled 4-inches deep with 12 inch long, grade 60, #4 rebar. Abutting sidewalk shall be doweled mid-section with a minimum of two dowels. Abutting curb and gutter ends shall be doweled twice, 18 inches apart, centered on the curb and gutter section. If the dowels were not set with the existing concrete, the penetrating portion of the dowel shall be coated with two-part epoxy in conformance with Caltrans Standard Specifications Section 95-1.

Attention is directed to “Painting” of the Standard Specifications. Existing painted concrete curb that are replaced shall be repainted with two coats of paint per the manufacturer’s recommendations. Curbs of median islands in the center of the roadway shall be painted yellow and median island curbs on the roadway edges shall be white or red as shown on the plans and as directed by the Engineer.

Stamped concrete areas shall be a brick red two color system with a base color hardener and a release color. Color hardener and release shall be applied and installed in accordance with the manufacturer’s written recommendations. Color system need not extend the full depth of the concrete section but will be incorporated into a minimum of the top 3 inches. Non colored concrete shall be prevented from intermixing into colored concrete sections.

The stamp pattern shall be a running bond pattern or approved equal.

A sample, of sufficient size, to demonstrate the finish of the stamped concrete crosswalk, including color hardener, curing and finishing compounds shall be submitted to the Engineer for written approval. Stamped concrete shall not be placed on the project prior to approval by the Engineer of the samples prepared and submitted by the Contractor. In the event more than one sample of the stamped concrete to be placed is required by the Engineer, each additional sample will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.
Floor color hardener shall be applied to the plastic surface of the concrete by the "dry-shake" method using a minimum of 60 pounds of hardener per 100 square feet. Hardener shall be applied in 2 applications, shall be wood-floated after each application, and shall be trowelled only after the final floating. The resultant color of the floor hardener shall closely conform to the colors specified on the plans for the respective areas.

The forming tools for the stamped concrete shall be applied to form the patterned surfaces while the concrete is still in the plastic stage of set. Stamped concrete areas shall be cured by the curing compound method. The curing compound shall be curing compound (6) conforming to the provisions in Section 90-7.01B, "Curing Compound Method," of the Standard Specifications.

The Contractor shall protect the stamped concrete areas, and other miscellaneous concrete areas within the travel way, to allow for proper curing time. This requirement shall not relieve the Contractor from maintaining the full width of the travel way open for public use, as specified in “Maintaining Traffic” of these Special Provisions.

The contract price paid per square foot for “Minor Concrete (Sidewalk/Curb Ramp, Valley Gutter) shall include all the work involved in constructing sidewalks, curb ramps and valley gutters, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

The contract price paid per linear foot for “Minor Concrete (Curb, Curb and Gutter) shall include all the work involved in constructing concrete curbing, and combination curb and gutters, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

The contract price paid per square foot for “Minor Concrete (Stamped Median, Stamped Crosswalk) shall include all the work involved in constructing stamped medians and crosswalks complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in the installation of minor concrete including, but not limited to: subgrade preparation; forming and constructing sidewalks, curb ramps, curbs, valley gutters, medians and crosswalks; and concrete finishing, grooving and stamping, shall be included in the contract price paid for “Minor Concrete (Type)” and no additional compensation will be allowed.

10-1.32 DETECTABLE WARNING SURFACE

Detectable warning surfaces shall be installed at the curb ramp locations shown on the plans and as directed by the Engineer, in accordance with the Standard Specifications and these Special Provisions. Curb ramp detectable warning surface shall consist of raised truncated domes in conformance with the details shown on the plans and the Standard Plans.

The detectable warning surface shall be prefabricated. The color of the detectable warning surface shall be yellow conforming to Federal Standard 595B, Color No. 33538. Prefabricated detectable warning surface shall be in conformance with the requirements established by the Department of General Services, Division of State Architect and be attached in conformance with the manufacturer's recommendations.

The finished surfaces of the detectable warning surface shall be free from blemishes. The manufacturer shall provide a written 5-year warranty for prefabricated detectable warning surfaces, guaranteeing replacement when there is defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty period shall begin upon acceptance of the contract.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in the installation of detectable warning surfaces including, but not limited to: setting prefabricated warning surface into wet concrete, finishing and grooving concrete around warning surface border, and protecting the surface during construction operations shall be included in the contract price paid for each “Detectable Warning Surface” and no additional compensation will be allowed.

10-1.33 ADJUST MANHOLE TO GRADE

Manholes shall be adjusted to grade in accordance with Section 15-2.10B “Adjust Frames, Covers, Grates, and Manholes” of the Standard Specifications, the City of Grass Valley Standard Detail ST-28 “Adjust Utility Cover/Manhole to Grade” and these Special Provisions.

The Contractor shall accurately locate and record the location of all manholes to be raised to grade and shall furnish the Engineer a copy of said record prior to resurfacing the street.

Prior to removal of an existing manhole frame, a platform shall be placed in the manhole above the top of the sewer or storm drain. The platform shall remain in place until all work on the manhole has been completed and the asphalt concrete has been placed around the manhole. Once adjustment of the manhole is complete, all dirt and debris shall be removed from the platform and the invert of the manhole.

Trimming of manhole cones (tapered section) will not be permitted.

All sections of the manhole grade rings shall be set in cement mortar and all joints smoothly grouted inside and out. The top of the completed manhole shall contain at least one 3-inch grade adjustment ring.

All manhole frames and covers shall be adjusted to grade after placement of the finish course of asphalt concrete.
Existing grade adjustment rings removed in the adjustment of manhole frames shall become the property of the Contractor and, if undamaged and thoroughly cleaned of mortar, may be reused in the work.

Waste materials generated while adjusting the manhole frames and covers to grade shall be disposed of outside the right-of-way.

Concrete used for collars and bases shall conform to the provisions in Section 90-10, “Minor Concrete,” of the Standard Specifications. Portland Cement Concrete shall be Class A, conforming to the provisions of Section 90, “Portland Cement Concrete,” of the Standard Specifications.

Manhole frame and covers adjusted to grade will be measured and paid for as units from actual count, complete and in place. Manhole frame and covers that do not require adjustment to grade, at the direction of the Engineer, shall not be paid for.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved, including, but not limited to, excavation, backfill, concrete, grade rings, mortar and hot mix asphalt shall be included in the contract unit price for “Adjust Manhole to Grade” as shown on the plans, as specified in these Special Provisions and as directed by the Engineer and no additional compensation will be allowed.

10-1.34 ADJUST UTILITY COVER TO GRADE

Utility cover boxes shall be adjusted to grade in accordance with the City of Grass Valley Improvement Standards, and these Special Provisions.

The Contractor shall accurately locate and record the location of all valve covers to be adjusted to grade and shall furnish the Engineer a copy of said record prior to paving. Contractor is responsible for protecting utilities per Section 5-1.36 “Property and Facility Preservation” of the Standard Specifications. Utilities include but are not limited to electrical vaults, telephone boxes, water meters, and water valves.

For utilities within overlay areas, all utility boxes must be exposed within 24 hours of paving, and the structures adjusted to grade within 72 hours of being covered by overlay.

For utilities within asphalt concrete replacement areas, adjustment may not be necessary if the existing cover is properly set to the proposed finish grade and the Engineer and Contractor agree that conforming to the existing cover would result in a better end product. Contractor shall protect the existing utility during resurfacing operations.

For utilities in areas of concrete improvements to be reconstructed, care shall be taken to protect the utility during construction and adjust the utility to finished grade (if different from existing grade). Each of the respective utility companies shall retain the ability to decrease the amount of a contract item of work or eliminate in its entirety.

Contractor shall provide at least 48 hours advance notice to each respective owner of castings to be adjusted to grade.

Waste materials generated while adjusting the water valve box frame and cover to grade shall be completely removed and disposed of in accordance with “Disposal of Material Outside the Highway Right of Way” of the Standard Specifications.

Concrete used for collars shall conform to the provisions in “Minor Concrete” of the Standard Specifications. Portland Cement Concrete shall be Class A, conforming to the provisions of “Portland Cement Concrete” of the Standard Specifications.

Utility covers adjusted to grade will be measured and paid for as units from actual count, complete and in place. Only those utility covers that require excavation and readjustment after asphalt concrete paving shall be paid for. Payment for covers that are conformed to or reset to grade in advance of concrete replacement shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved including, but not limited to, excavation, backfill, concrete and hot mix asphalt shall be included in the contract unit price for “Adjust Utility Cover to Grade” as shown on the plans, as specified in these Special Provisions and as directed by the Engineer and no additional compensation will be allowed.

10-1.35 RELOCATE STREET LIGHT

Existing street lights shall be removed, salvaged, protected and relocated as shown on the plans and in conformance with “Electrical Systems” of the Standard Specifications, City of Grass Valley Improvement Standards, and these Special Provisions.

Existing concrete foundations may be abandoned in place, except that the top portion, including anchor bolts, reinforcing steel, and conduits shall be removed to below finished sidewalk subgrade.

Electrical conductor wiring shall be removed to the nearest pull box, spliced and new wire installed in kind to the new street light location.
10-1.35.1 **CONDUIT**

Install new conduit runs for street light conductor wiring from existing pull boxes to new light location or extend existing conduit as appropriate.

New conduit shall match existing size and material type.

In sidewalk areas, install conduit a minimum of 18 inches below finish grade or match existing depth.

10-1.35.2 **FOUNDATION**

Construct new concrete street light foundation in conformance with "Minor Concrete" of the Standard Specifications, City of Grass Valley Improvement Standards, and these Special Provisions.

Construct concrete foundation on firm ground. Form exposed portion of the foundation to present a neat appearance and true to line and grade. The top of a foundation for post and standard must be finished to curb or sidewalk grade. Forms must be rigid and securely braced in place. Conduit ends and anchor bolts must be placed at proper height and position.

Provide new foundation and anchor bolts of the proper type and size for relocated standards. Unless otherwise specified street light foundations shall be 2'-0" diameter and a minimum 3'-6" deep.

Anchor bolts shall be installed per manufacturer’s recommendations. Steel parts must be galvanized as specified in Section 75-1.05, "Galvanizing."

10-1.35.3 **PAYMENT**

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in relocating existing street lights, including, but not limited to, street light removal and salvaging, excavation, backfill, conduit placement, anchor bolt placement, foundation construction, wiring, splicing, connecting and testing shall be included in the contract lump sum price for “Relocate Street Light” as shown on the plans, as specified in these Special Provisions and as directed by the Engineer and no additional compensation will be allowed.

10-1.36 **ROADSIDE SIGN AND OBJECT MARKER**

Roadside signs shall be furnished and installed at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in "Roadside Signs," of the Standard Specifications and these Special Provisions.

Sign posts shall be a 2” X 2” square metal tube conforming to the standard specifications for cold rolled carbon sheet steel, commercial quality, ASTM A-446 or hot rolled carbon steel sheet, structural quality, ASTM A-570-90 and ASTM A-653-94 structural grade 50.

The finished posts shall be straight and shall have a smooth uniform finish. All holes and ends shall be free from burrs and the ends shall be cut square. Permissible variation in the straightness is one-sixteenth of an inch in three feet. The square tubes shall have holes that are seven-sixteenths plus or minus one sixty-fourth inches diameter on one (1) inch centers, on all four sides for the entire length of the pole. The holes shall be on the centerline of each side in true alignment and opposite to each other directly and diagonally. All posts shall be cut in such a manner to ensure hole alignment between anchors and sleeves when driven into the ground.

Square tubes shall be installed into a sleeve of the same material. A 27-inch long anchor sleeve shall be embedded in Class B/Class 3, 5-sack concrete that is placed in an excavated hole a minimum of 36-inches deep and 6-inches in diameter. Two holes of the sleeve shall remain showing above the finished grade, with all holes below grade taped closed. No material other than the square post shall intrude into the sleeve. The square signpost inside the sleeve shall move freely in the vertical direction after installation.

All posts shall be long enough such that the lowest hanging sign mounted on the post is a minimum of seven feet above the finish grade or walkway, if located in a sidewalk.

The contract price paid for each roadside sign shall be considered to consist of the complete sign assembly including, post, footing, primary sign panel and any additional sign plaques attached to the same post as shown on the plans or as directed by the Engineer.

Object markers shall be Type K-1 per the Standard Specifications and as shown on the plans. Uprights shall be flexible plastic with a rebounding spring assembly, on a surface mount base properly secured with bolts or adhesive.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals including but not limited to, sign panels, post(s), epoxy and hardware, and for doing all work involved in furnishing and installing object markers, complete in place, as shown on the plans, as specified in the Standard Specifications, the Standard Plans, these Special Provisions, and as directed by the Engineer shall be included in the contract unit price paid for “Object Marker” and no additional compensation will be allowed.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals including but not limited to, sign panels, post(s), brackets, lag screws, washers, and hardware, and for doing all work involved in furnishing and installing roadside signs, complete in place, as shown on the plans, as specified in the Standard Specifications, the Standard
Plans, these Special Provisions, and as directed by the Engineer shall be included in the contract unit price paid for “Roadside Sign” and no additional compensation will be allowed.

10-1.36.1 FURNISH SIGN

Signs shall be fabricated and furnished in accordance with details shown on the plans, the Traffic Sign Specifications, and these Special Provisions.


Temporary or permanent signs shall be free from blemishes that may affect the serviceability and detract from the general sign color and appearance when viewing during daytime and nighttime from a distance of 25 feet. The face of each finished sign shall be uniform, flat, smooth, and free of defects, scratches, wrinkles, gel, hard spots, streaks, extrusion marks, and air bubbles. The front, back, and edges of the sign panels shall be free of router chatter marks, burns, sharp edges, loose rivets, delaminated skins, excessive adhesive over spray and aluminum marks.

No later than 14 days before sign fabrication, the Contractor shall submit a written copy of the quality control plan for signs to the Engineer for review. The Engineer will have 10 days to review the quality control plan. Sign fabrication shall not begin until the Engineer approves the Contractor's quality control plan in writing. The Contractor shall submit to the Engineer at least 3 copies of the approved quality control plan. The quality control plan shall include, but not be limited to the following requirements:

A. Identification of the party responsible for quality control of signs,
B. Basis of acceptance for incoming raw materials at the fabrication facility,
C. Type, method and frequency of quality control testing at the fabrication facility,
D. List (by manufacturer and product name) of process colors, protective overlay film, retroreflective sheeting and black non-reflective film,
E. Recommended cleaning procedure for each product, and
F. Method of packaging, transport and storage for signs.

No legend shall be installed at the project site. Legend shall include letters, numerals, tildes, bars, arrows, route shields, symbols, logos, borders, artwork, and miscellaneous characters. The style, font, size, and spacing of the legend shall conform to the Standard Alphabets published in the FHWA Standard Highway Signs Book. The legend shall be oriented in the same direction in accordance with the manufacturer's orientation marks found on the retroreflective sheeting.

On multiple panel signs, legend shall be placed across joints without affecting the size, shape, spacing, and appearance of the legend. Background and legend shall be wrapped around interior edges of formed panel signs as shown on plans to prevent delamination.

All signs shall have the following notation placed on the lower right side of the back of each sign where the notation will not be blocked by the sign post or frame:

A. Name of the sign manufacturer,
B. Month and year of fabrication,
C. Type of retroreflective sheeting, and
D. Manufacturer's identification and lot number of retroreflective sheeting.

Signs with a protective overlay film shall be marked with a dot of 3/8 inch in diameter. The dot placed on white border shall be black, while the dot placed on black border shall be white. The dot shall be placed on the lower border of the sign before application of the protective overlay film and shall not be placed over the legend and bolt holes. The application method and exact location of the dot shall be determined by the manufacturer of the signs.

For sign panels that have a minor dimension of 48 inches or less, no splice will be allowed in the retroreflective sheet except for the splice produced during the manufacturing of the retroreflective sheeting. For sign panels that have a minor dimension greater than 48 inches, only one horizontal splice will be allowed in the retroreflective sheeting.

Unless specified by the manufacturer of the retroreflective sheeting, splices in retroreflective sheeting shall overlap by a minimum of one inch. Splices shall not be placed within 2 inches from edges of the panels. Except at the horizontal borders, the splices shall overlap in the direction from top to bottom of the sign to prevent moisture penetration. The retroreflective sheeting at the overlap shall not exhibit a color difference under the incident and reflected light. Signs exhibiting a significant color difference between daytime and nighttime shall be replaced immediately.
The Department will inspect signs at the delivery location, and in accordance with Section 6, "Control of Materials," of the Standard Specifications. The Engineer will inspect signs for damage and defects before and after installation. Repairing sign panels will not be allowed except when approved by the Engineer.

Regardless of kind, size, type, or whether delivered by the Contractor or by a common carrier, signs shall be protected by thorough wrapping, taping, or other methods to ensure that signs are not damaged by weather conditions and during transit. Signs shall be dry during transit and shipped on pallets, in crates, or tier racks. Padding and protective materials shall be placed between signs as appropriate. Finished sign panels shall be transported and stored by method that protects the face of signs from damage. The Contractor shall replace wet, damaged, and defective signs.

Signs shall be stored in a dry environment at all times. Signs shall not rest directly on the ground or become wet during storage. Signs, whether stored indoor or outdoor, shall be free standing. In areas of high heat and humidity signs shall be stored in enclosed climate-controlled trailers or containers. Signs shall be stored indoor if duration of the storage will exceed 30 days. Screen processed signs shall be protected, transported and stored as recommended by the manufacturer of the retroreflective sheeting.

When requested, the Contractor shall provide the Engineer test samples of signs and materials used at various stages of production. Sign samples shall be 12" x 12" in size with applied background, letter or numeral, and border strip.

Full compensation for all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and fabricating signs, including all required quality control measures as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be considered as included in the contract unit price paid for "Roadside Sign," and no separate payment will be made.

**10-1.36.2 SIGN MATERIALS**

Alloy and temper designations for sheet aluminum shall be in accordance with ASTM Designation: B 209. The Contractor shall furnish the Engineer a Certificate of Compliance in conformance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for the sheet aluminum.

Sheet aluminum shall be pretreated in accordance to ASTM Designation: B 449. Surface of the sheet aluminum shall be cleaned, deoxidized, and coated with a light and tightly adherent chromate conversion coating free of powdery residue. The conversion coating shall be Class 2 with a weight between 10 milligrams per square foot and 35 milligrams per square foot, and an average weight of 25 milligrams per square foot. Following the cleaning and coating process, the sheet aluminum shall be protected from exposure to grease, oils, dust, and contaminants. Sheet aluminum shall be free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication.

Single sheet aluminum signs shall be fabricated and furnished with or without frame. The Contractor shall furnish the sheet aluminum in accordance to "Sheet Aluminum" of these Special Provisions. Single sheet aluminum signs shall be fabricated from sheet aluminum alloy 6061-T6 or 5052-H38.

Single sheet aluminum signs shall not have a vertical splice in the sheet aluminum. For signs with depth greater than 48 inches, one horizontal splice will be allowed in the sheet aluminum.

Framing for single sheet aluminum signs shall consist of aluminum channel or rectangular aluminum tubing. The framing shall have a length tolerance of ±1/8 inch. The face sheet shall be affixed to the frame with rivets of 3/16-inch diameter. Rivets shall be placed within the web of channels and shall not be placed less than 1/2 inch from edges of the sign panels. Rivets shall be made of aluminum alloy 5052 and shall be anodized or treated with conversion coating to prevent corrosion. The exposed portion of rivets on the face of signs shall be the same color as the background or legend where the rivets are placed.

Finished signs shall be flat within a tolerance of ±1/32 inch per linear foot when measured across the plane of the sign in all directions. The finished signs shall have an overall tolerance within ±1/8 inch of the detailed dimensions.

Aluminum channels or rectangular aluminum tubings shall be welded together with the inert gas shielded-arc welding process using E4043 aluminum electrode filler wires as shown on the plans. Width of the filler shall be equal to wall thickness of smallest welded channel or tubing.

The Contractor shall furnish retroreflective sheeting for sign background and legend in conformance with ASTM Designation: D 4956 and "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions. Retroreflective sheeting shall be applied to sign panels as recommended by the retroreflective sheeting manufacturer without stretching, tearing, and damage.

Class 1, 3, or 4 adhesive backing shall be used for Type II, III, IV, VII, VIII, and IX retroreflective sheeting. Class 2 adhesive backing may also be used for Type II retroreflective sheeting. The adhesive backing shall be pressure sensitive and fungus resistant.

The Contractor shall furnish and apply screened process color, non-reflective opaque black film, and protective overlay film of the type, kind, and product that are approved by the manufacturer of the retroreflective sheeting. The Contractor shall provide patterns, layouts, and set-ups necessary for the screened process.
The Contractor shall furnish the Engineer a Certificate of Compliance in accordance to Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for the screened process color, non-reflective opaque black film, and protective overlay film.

The surface of the screened process color shall be flat and smooth. When the screened process colors determined from the instrumental testing in accordance to ASTM Designation: D 4956 are in dispute, the Engineer's visual test will govern.

The Contractor may use green, red, blue, and brown reverse-screened process colors for background and non-reflective opaque black film or black screened process color for legend. The coefficient of retroreflection for reverse-screened process colors on white retroreflective sheeting shall not be less than 70 percent of the coefficient of retroreflective specified in ASTM Designation: D 4956.

The screened process colors and non-reflective opaque black film shall have the same outdoor weatherability as that of the retroreflective sheeting. After curing, screened process colors shall withstand removal when tested by applying 3M Company Scotch Brand Cellophane Tape No. 600 or equivalent tape over the color and removing with one quick motion at 90° angle.

Full compensation for furnishing all labor, tools, equipment, and materials, including sheet aluminum, single sheet aluminum, retroreflective sheeting, and screened process color, as shown on the plans, as specified in the Standard Specifications, these Special Provisions and as directed by the Engineer shall be considered as included in the contract unit price paid for "Roadside Sign," and no separate payment will be made.

10-1.37 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING

Thermoplastic traffic stripes (traffic lines) and pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these Special Provisions.

Thermoplastic material shall be free of lead and chromium, and shall conform to the requirements in State Specification PTH-02ALKYD.

Retroreflectivity of the thermoplastic traffic stripes and pavement markings shall conform to the requirements in ASTM Designation: D 6359-99. White thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 250 mcd m⁻² lx⁻¹. Yellow thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 150 mcd m⁻² lx⁻¹.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Thermoplastic material for traffic stripes shall be applied at a minimum rate of 0.20-lb/ft. The minimum application rate is based on a solid stripe of 4 inches in width. Thermoplastic traffic stripes shall be applied at the minimum thickness of 0.059-inch. Thermoplastic traffic stripes and pavement markings shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

At the option of the Contractor, permanent traffic striping and pavement marking tape conforming to the provisions in "Pre-qualified and Tested Signing and Delineation Materials" of these Special Provisions may be placed instead of the thermoplastic traffic stripes and pavement markings specified herein. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications. If permanent tape is placed instead of thermoplastic traffic stripes and pavement markings, the tape will be measured and paid for by the linear foot as thermoplastic traffic stripe and by the square foot as thermoplastic pavement marking.

Thermoplastic traffic stripes will be measured by the linear foot along the line of the traffic stripes, without deductions for gaps in broken traffic stripes. Deductions will be made at cross streets and driveways as applicable. A double traffic stripe, consisting of two 4-inch wide yellow stripes, shall be measured and paid for as one (1) traffic stripe.

Where existing pavement delineation is to be covered or obliterated by the Contractor's work or where the existing striping alignment and marking placement is shown to be substantially modified, the Contractor shall demarcate the proposed layout prior to placement of permanent striping and marking. The Contractor shall notify the Engineer in advance of beginning layout work and shall spot, track or outline the proposed delineation for field acceptance by the Engineer.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying thermoplastic traffic stripes complete in place, including establishing alignment for stripes and layout work, as shown on the plans, as specified in the Standard Specifications and the Special Provisions, and as directed by the Engineer shall be included in the contract price paid per linear foot for "Thermoplastic Traffic Stripe," and no additional compensation will be allowed.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in applying thermoplastic traffic markings complete in place, as shown on the plans, as specified in the Standard Specifications and the Special Provisions, and as directed by the Engineer shall be included in the contract price paid per square foot for "Thermoplastic Traffic Markings," and no additional compensation will be allowed.
10-1.38 FINISHING ROADWAY


Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in finishing roadway, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions and as directed by the Engineer will be considered as included in the Contract prices for various items of work requiring roadway finishing and no additional compensation will be allowed.

10-1.39 NOTIFICATION AND SCHEDULING

The Contractor shall deliver a “NOTICE” to all residents and businesses of properties adjacent to the project streets and those on connecting streets that have no other means of accessing their properties but through the project or are otherwise adversely affected by the scheduled project operations. The Contractor will provide a standard “NOTICE” form in sufficient numbers to permit distribution to all homes and businesses within a 500 foot radius of the project site. The Contractor will complete the “NOTICE” forms by entering the name of the firm, local and toll free telephone number, date of issuance, and shall indicate on the notice street closures, traffic control measure or outages that are expected to be in place.

“NOTICE” forms shall be issued to the affected properties no later than forty-eight (48) hours prior to the work. The Contractor shall be responsible for removing any “NOTICES” that were not removed by the resident or business after all work is completed by the Contractor or as directed by the Engineer. Any costs associated with towing of vehicles in the way of construction shall be borne by the Contractor. “NOTICE” shall not be left in mailboxes, per Section PO 11.2.1 of the Domestic Mail Manual (DMM). The Contractor shall be held liable for any fines.

The Contractor shall coordinate with the Engineer to notify the Police Department, Fire Department, Ambulance Service, Waste Management, Post Office, Durham Transportation, and Gold Country Stage forty-eight (48) hours prior to any lane closure. Notification may be in conjunction with the scheduling requirements of the “SCHEDULING” portion of the Standard Specifications. Particular attention shall be given to the construction of adequate facilities on any street to permit the passing of emergency vehicles.

None of the provisions specified herein shall be construed to restrict or prohibit, at any time, the prosecution of items of work which will not interfere with the use of existing streets.

Full compensation for all work associated with furnishing, distributing and removal, as required, of all notices; for contacting and coordinating with applicable agencies, schools, etc; and for all incidentals of work required within this “Notification and Scheduling” section will be considered as included in the contract prices paid for various items of work and no additional compensation will be allowed.
NOTICE

Date Delivered: ______________

Dear Property Owner:

In the interest of minimizing the inconvenience caused by the WEST MAIN STREET REHABILITATION PROJECT we are providing you at least 48 hours notice that the following work is proposed to be done in the vicinity of your property or affecting access to your property beginning on _________________ from _____ a.m./p.m. to _____ a.m./p.m.:

______Concrete Replacement
______Paving
______Other:

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

We appreciate your patience and cooperation while this work is underway.

Please call (___) _____ – ________ to contact the Contractor if you have any questions or wish additional information regarding this work, or contact the City of Grass Valley Engineering Division at (530) 274-4373.

________________________
Contractor’s Name
10-1.40 RECORD DRAWINGS

The Contractor shall keep accurate records on a set of project prints (24” x 36”) of all additions and deletions of the work, and all of the changes in location, elevation, and character of the work not otherwise shown or noted on the contract plans. The City will furnish three (3) sets of full size prints for the “Record Drawings” plans at no cost to the Contractor.

“Record Drawings” construction plans shall be provided to the City after completion of the project. Two (2) copies shall be provided with changes to the original contract work shown in red color. The Contractor shall transmit these “Record Drawings” plans to the Engineer for approval. Details to be shown on the “Record Drawings” plans shall include, but not be limited to, type, quantity, and location of pipe runs, location and elevations of facilities, and any other modifications, additions or adjustments to any other facilities in the project.

“Record Drawings” construction plans shall be signed and dated by the Contractor or the Subcontractor that actually constructed the facility. In addition, company names of the Contractor and Subcontractors shall be added to the title sheet.

The cost of record keeping to provide the information for these “Record Drawings” plans and all work associated with preparing accurate “Record Drawings” construction plans shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed.
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 revised term, phrase, clause, paragraph, or section. For a multiple-paragraph or multiple-section revision, the date on the right above a paragraph or section is the publication date of the paragraphs or sections that follow.

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

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ORGANIZATIONAL REVISIONS

07-19-13
Transfer section 36 from division IV to division V.

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DIVISION I  GENERAL PROVISIONS

1  GENERAL

10-17-14
Replace "current" in the 2nd paragraph of section 1-1.05 with:

04-20-12
most recent

Add to the 4th paragraph of section 1-1.05:

04-20-12
Any reference directly to a revised standard specification section is for convenience only. Lack of a direct reference to a revised standard specification section does not indicate a revised standard specification for the section does not exist.

Replace "MSDS" in the 1st table in section 1-1.06 with:

10-17-14
MSDSb
Add to the 1st table in section 1-1.06:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCS</td>
<td>Department's lane closure system</td>
</tr>
<tr>
<td>POC</td>
<td>pedestrian overcrossing</td>
</tr>
<tr>
<td>QSD</td>
<td>qualified SWPPP developer</td>
</tr>
<tr>
<td>QSP</td>
<td>qualified SWPPP practitioner</td>
</tr>
<tr>
<td>SDS</td>
<td>safety data sheet</td>
</tr>
<tr>
<td>TRO</td>
<td>time-related overhead</td>
</tr>
<tr>
<td>WPC</td>
<td>water pollution control</td>
</tr>
</tbody>
</table>

Add to the notes of the 1st table in section 1-1.06:

bInterpret a reference to MSDS as a reference to SDS under 29 CFR 1910.1200.

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

Delete "Contract completion date" and its definition in section 1-1.07B.

Delete "critical delay" and its definition in section 1-1.07B.

Replace "day" and its definition in section 1-1.07B with:

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

1. **business day**: Day on the calendar except a Saturday and a holiday.
2. **working day**: Time measure unit for work progress. A working day is any 24-consecutive-hour period except:
   
   2.1. Saturday and holiday.
   
   2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
   
   2.2.1. Adverse weather-related conditions.
   2.2.2. Maintaining traffic under the Contract.
   2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
   2.2.4. Unanticipated event not caused by either party such as:
      
      2.2.4.1. Act of God.
      2.2.4.2. Act of a public enemy.
      2.2.4.3. Epidemic.
      2.2.4.4. Fire.
      2.2.4.5. Flood.
      2.2.4.6. Governor-declared state of emergency.
      2.2.4.7. Landslide.
      2.2.4.8. Quarantine restriction.
   2.2.5. Issue involving a third party, including:
      
      2.2.5.1. Industry or area-wide labor strike.
      2.2.5.2. Material shortage.
      2.2.5.3. Freight embargo.
      2.2.5.4. Jurisdictional requirement of a law enforcement agency.
      2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's
convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.

2.3. Day during a concurrent delay.

3. **original working days:**
   3.1. Working days to complete the work shown on the Notice to Bidders for a non–cost plus time based bid.
   3.2. Working days bid to complete the work for a cost plus time based bid.

Where working days is specified without the modifier "original" in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.

Replace "Contract" in the definition of "early completion time" in section 1-1.07B with:

Replace "excusable delay" and its definition in section 1-1.07B with:

**delay:** Event that extends the completion of an activity.

1. **excusable delay:** Delay caused by the Department and not reasonably foreseeable when the work began such as:
   1.1. Change in the work
   1.2. Department action that is not part of the Contract
   1.3. Presence of an underground utility main not described in the Contract or in a location substantially different from that specified
   1.4. Described facility rearrangement not rearranged as described, by the utility owner by the date specified, unless the rearrangement is solely for the Contractor's convenience
   1.5. Department's failure to obtain timely access to the right-of-way
   1.6. Department's failure to review a submittal or provide notification in the time specified

2. **critical delay:** Excusable delay that extends the scheduled completion date

3. **concurrent delay:** Occurrence of at least 2 of the following events in the same period of time, either partially or entirely:
   3.1. Critical delay
   3.2. Delay to a controlling activity caused by you
   3.3. Non–working day

Replace "project" in the definition of "scheduled completion date" in section 1-1.07B with:

**Contract time:** Number of original working days as adjusted by any time adjustment.

**Disadvantaged Business Enterprise:** Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

Replace "PO BOX 911" in the District 3 mailing address in the table in section 1-1.08 with:

703 B ST

Replace the Web site for the Department of General Services, Office of Small Business and DVBE Services in the table in section 1-1.11 with:

http://www.dgs.ca.gov/dgs/ProgramsServices/BusServices.aspx
2 BIDDING

Replace the headings and paragraphs in section 2 with:

2-1.01 GENERAL
Section 2 includes specifications related to bid eligibility and the bidding process.

The electronic bid specifications in section 2 apply if Electronic Bidding Contract is shown on the cover of the Notice to Bidders and Special Provisions.

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

2-1.03–2-1.05 RESERVED

2-1.06 BID DOCUMENTS

2-1.06A General
The Bid book includes bid forms and certifications. For an electronic bid, the Bid book includes forms not available through the electronic bidding service.

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

The Bid book, including Bid book forms not available through the electronic bidding service, Notice to Bidders and Special Provisions, project plans, and any addenda to these documents may be accessed at the Bidders' Exchange website.

The Standard Specifications and Standard Plans may be viewed at the Bidders' Exchange website and may be purchased at the Publication Distribution Unit.

2-1.06B Supplemental Project Information
The Department makes supplemental information available as specified in the special provisions.

Logs of test borings are supplemental project information.

If an Information Handout or cross sections are available, you may view them at the Contract Plans and Special Provisions link at the Bidders' Exchange website.

If rock cores are available, you may view them by sending a request to Coreroom@dot.ca.gov.

If other supplemental project information is available for inspection, you may view it by phoning in a request.

Make your request at least 7 days before viewing. Include in your request:

1. District-County-Route
2. Contract number
3. Viewing date
4. Contact information, including telephone number

For rock cores, also include the bridge number in your request.

If bridge as-built drawings are available:
1. For a project in District 1 through 6 or 10, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357
2. For a project in District 7, 8, 9, 11, or 12, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357, and they are available at the Office of Structure Maintenance and Investigations, Los Angeles, CA, telephone (213) 897-0877

As-built drawings may not show existing dimensions and conditions. Where new construction dimensions are dependent on existing bridge dimensions, verify the field dimensions and adjust dimensions of the work to fit existing conditions.

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 the Bid Item List.

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. For a non-federal-aid contract, its California contractor license number.
3. Portion of work it will perform. Show the portion of the work by:
   3.1. Description of portion of subcontracted work
   3.2. Bid item numbers for the work involved in the portion of work listed
   3.3. Percentage of the portion of work in each bid item listed

2-1.11 RESERVED

2-1.12 DISADVANTAGED BUSINESS ENTERPRISES
2-1.12A General
Section 2-1.12 applies to a federal-aid contract.

Under 49 CFR 26.13(b):

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

(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

Include this assurance in each subcontract you sign with a subcontractor.

2-1.12B Disadvantaged Business Enterprise Goal

2-1.12B(1) General

Section 2-1.12B applies if a DBE goal is shown on the Notice to Bidders.

The Department shows a goal for DBEs to comply with the DBE program objectives provided in 49 CFR 26.1.

Make work available to DBEs and select work parts consistent with available DBEs, including subcontractors, suppliers, service providers, and truckers.

Meet the DBE goal shown on the Notice to Bidders or demonstrate that you made adequate good faith efforts to meet this goal.

You are responsible to verify at bid opening the DBE firm is certified as a DBE by the California Unified Certification Program and possess the work codes applicable to the type of work the firm will perform on the Contract.

Determine that selected DBEs perform a commercially useful function for the type of work the DBE will perform on the Contract as provided in 49 CFR 26.55(c)(1)–(4). Under 49 CFR 26.55(c)(1)–(4), the DBE must be responsible for the execution of a distinct element of work and must carry out its responsibility by actually performing, managing, and supervising the work.

All DBE participation will count toward the Department's federally-mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs will be evaluated on a contract-by-contract basis and counts toward the goal in the following manner:

1. 100 percent if the materials or supplies are obtained from a DBE manufacturer.
2. 60 percent if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies, if they are obtained from a DBE that is neither a manufacturer nor regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit toward the goal if you employ a DBE trucking company that is performing a commercially useful function. The Department uses the following factors in determining whether a DBE trucking company is performing a commercially useful function:

• The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
• The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
• The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures, and operates using drivers it employs.
• The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
• The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
• A lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

[49 Fed Reg 59595 (10/2/14) (to be codified at 49 CFR 26.55(d))]
2-1.12B(2) DBE Commitment Submittal
Submit DBE information under section 2-1.33.
Submit written confirmation from each DBE shown on the DBE Commitment form stating that it will be participating in the Contract in the type and amount of work shown on the form. If a DBE is participating as a joint venture partner, submit a copy of the joint venture agreement.

2-1.12B(3) DBE Good Faith Efforts Submittal
You can meet the DBE requirements by either documenting commitments to DBEs to meet the Contract goal or by documenting adequate good faith efforts to meet the Contract goal. An adequate good faith effort means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal that, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to meet the DBE goal.

If you have not met the DBE goal, complete and submit the DBE Good Faith Efforts Documentation form under section 2-1.33 showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed toward obtaining participation by DBEs are considered.

Submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the Department finds that the DBE goal has not been met.

Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

The Department considers DBE commitments of other bidders in determining whether the low bidder made good faith efforts to meet the DBE goal.

2-1.13–2-1.14 RESERVED

2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES
2-1.15A General
Section 2-1.15 applies to a non-federal-aid contract.
Take necessary and reasonable steps to ensure that DVBEs have the opportunity to participate in the Contract.
Comply with Mil & Vet Code § 999 et seq.

2-1.15B Projects $5 Million or Less
Section 2-1.15B applies to a project with an estimated cost of $5 million or less.
Make work available to DVBEs and select work parts consistent with available DVBE subcontractors and suppliers.
Meet the goal shown on the Notice to Bidders.
Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.
If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.
List each 1st-tier DVBE subcontractor on the Subcontractor List form regardless of percentage of the total bid.

2-1.15C Projects More Than $5 Million
2-1.15C(1) General
Section 2-1.15C applies to a project with an estimated cost of more than $5 million.
The Department encourages bidders to obtain DVBE participation to ensure the Department achieves its State-mandated overall DVBE goal.
If you obtain DVBE participation:
1. Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.
2. List each 1st tier DVBE subcontractor in the Subcontractor List form regardless of percentage of the total bid.
If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.

2-1.15C(2) DVBE Incentive
The Department grants a DVBE incentive to each bidder who achieves a DVBE participation of 1 percent or greater (Mil & Vet Code 999.5 and Code of Regs § 1896.98 et seq.).

To receive this incentive, submit the Certified DVBE Summary form under section 2-1.33.

Bidders other than the apparent low bidder, the 2nd low bidder, and the 3rd low bidder may be required to submit the Certified DVBE Summary form if the bid ranking changes. If the Department requests a Certified DVBE Summary form from you, submit the completed form within 4 business days of the request.

2-1.15C(3) Incentive Evaluation
The Department applies the small business and non–small business preference during bid verification and proceeds with the evaluation specified below for DVBE incentive.

The DVBE incentive is a reduction, for bid comparison only, in the total bid submitted by the lesser of the following amounts:
1. Percentage of DVBE achievement rounded to 2 decimal places of the verified total bid of the low bidder
2. 5 percent of the verified total bid of the low bidder
3. $250,000

The Department applies DVBE incentive and determines whether bid ranking changes.

A non–small business bidder cannot displace a small business bidder. However, a small business bidder with higher DVBE achievement can displace another small business bidder.

The Department proceeds with awarding the contract to the new low bidder and posts the new verified bid results at the Department's Web site.

2-1.16–2-1.17 RESERVED

2-1.18 SMALL BUSINESS AND NON–SMALL BUSINESS SUBCONTRACTOR PREFERENCES

2-1.18A General
Section 2-1.18 applies to a non-federal-aid contract.

The Department applies small business preferences and non–small business preferences under Govt Code § 14835 et seq. and 2 CA Code of Regs § 1896 et seq.

Any contractor, subcontractor, supplier, or service provider who qualifies as a small business is encouraged to apply for certification as a small business by submitting its application to the Department of General Services, Office of Small Business and DVBE Services.

Contract award is based on the total bid, not the reduced bid.

2-1.18B Small Business Preference
The Department allows a bidder certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:
2. Low bidder did not request the preference or is not certified as a small business

The bidder’s signature on the Request for Small Business Preference or Non–Small Business Preference form certifies that the bidder is certified as a small business at the date and time of bid or has submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The Department of General Services determines whether a bidder was certified on the bid opening date. The Department of Transportation confirms the bidder's status as a small business before applying the small business preference.
The small business preference is a reduction for bid comparison in the total bid submitted by the small business contractor by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. $50,000

If the Department determines that a certified small business bidder is the low bidder after the application of the small business preference, the Department does not consider a request for non–small business preference.

2-1.18C  Non–Small Business Subcontractor Preference
The Department allows a bidder not certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:

2. Certified Small Business Listing for the Non–Small Business Preference form shows that you are subcontracting at least 25 percent to certified small businesses

Each listed subcontractor and supplier must be certified as a small business at the date and time of bid or must have submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The non–small business subcontractor preference is a reduction for bid comparison in the total bid submitted by the non–small business contractor requesting the preference by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. $50,000

2-1.19–2-1.26  RESERVED

2-1.27  CALIFORNIA COMPANIES
Section 2-1.27 applies to a non-federal-aid contract.

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

Complete a California Company Preference form.

The California company reciprocal preference amount is equal to the preference amount applied by the state of the nonresident contractor with the lowest responsive bid unless the California company is eligible for a small business preference or a non–small business subcontractor preference, in which case the preference amount is the greater of the two, but not both.

If the low bidder is not a California company and a California company’s bid with reciprocal preference is equal to or less than the lowest bid, the Department awards the contract to the California company on the basis of its total bid.

2-1.28  RESERVED

2-1.29  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.

2-1.30–2-1.32  RESERVED

2-1.33  BID DOCUMENT COMPLETION AND SUBMITTAL
Complete the forms in the Bid book.

For a paper bid, submit your bid:

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

For an electronic bid, complete and submit the electronic portion of the Bid book under the *Electronic Bidding Guide* at the Bidders' Exchange website and submit the paper forms as specified for a paper bid.

Submit the forms and form information to the Office Engineer according to the schedule shown in the following table:

<table>
<thead>
<tr>
<th>Contract type</th>
<th>Forms to be submitted at the time of bid</th>
<th>Forms to be submitted no later than 24 hours after bid opening&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Forms to be submitted no later than 4 p.m. on the 2nd business day after bid opening&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Forms to be submitted no later than 4 p.m. on the 4th business day after bid opening&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
</table>
| All contracts          | • Bid to the Department of Transportation  
  • Business name and location and description of portion of subcontracted work on the Subcontractor List  
  • Opt Out of Payment Adjustments for Price Index Fluctuations<sup>c</sup> | • Bid item nos. and percentage of bid item subcontracted on the Subcontractor List<sup>b</sup> | -- | -- |
| Non-federal-aid contracts only | • California contractor license number on the Subcontractor List  
  • California Company Preference  
  • Request for Small Business Preference or Non–Small Business Preference<sup>c</sup> | | • Certified Small Business Listing for the Non–Small Business Preference<sup>c</sup> | • Certified DVBE Summary<sup>d</sup> |
| Federal-aid contracts only | • Small Business Status | -- | -- | • DBE Commitment  
  • DBE Good Faith Efforts Documentation |

<sup>a</sup>The forms and information may be submitted at the time of bid.

<sup>b</sup>If the information is not submitted at the time of bid, fax it to (916) 227-6282. This after-bid submittal does not apply to an informal-bid contract. For an informal bid contract, submit the completed form at the time of bid.

<sup>c</sup>Applicable only if the preference or option is chosen.

<sup>d</sup>Not applicable to an informal-bid contract or a project with an estimated cost of more than $5 million. For an informal bid contract, submit the completed form at the time of bid. For a project with an estimated cost of more than $5 million, applicable only if you obtain DVBE participation or you are the apparent low bidder, 2nd low bidder, or 3rd low bidder and you choose to receive the specified incentive.

For an electronic bid:

1. Forms to be submitted at the time of bid must be submitted as described in the *Electronic Bidding Guide*.
2. Your authorized digital signature is your confirmation of and agreement to all certifications and statements contained in the Bid book.
3. On forms and certifications that you submit through the electronic bidding service, you agree that each form and certification where a signature is required is deemed as having your signature. On forms that you do not submit through the electronic bidding service, sign the forms in ink where a signature is required.
Failure to submit the forms and information as specified may result in a nonresponsive bid.

If an agent other than the authorized corporate 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.

2-1.34 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
5. For an electronic bid, electronic bidder's bond by an admitted surety insurer submitted using an electronic registry service approved by the Department.

Submit cash, cashier’s check, certified check, or bidder's bond to the Department at the Bidders Exchange before the bid opening time.

Submit electronic bidder’s bond with the electronic bid.

If using a bidder's bond, you may use the form in the Bid book. If you do not use the form in the Bid book, use a form containing the same information.

2-1.35–2-1.39 RESERVED

2-1.40 BID WITHDRAWAL
For a paper bid:

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.
2. After the bid opening time, you cannot withdraw a bid.

For an electronic bid:

1. Bids are not filed with the Department until the date and time of bid opening.
2. A bidder may withdraw or revise a bid after it has been submitted to the electronic bidding service if this is done before the bid opening date and time.

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 the Office Engineer. The Relief of Bid Request form is available at the Department's website.
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.

2-1.50 BID RIGGING
Section 2-1.50 applies to a federal-aid contract.

The U.S. Department of Transportation (DOT) provides a toll-free hotline to report bid rigging activities. Use the hotline to report bid rigging, bidder collusion, and other fraudulent activities. The hotline number is (800) 424-9071. The service is available 24 hours 7 days a week and is confidential and anonymous. The hotline is part of the DOT's effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General.

3 CONTRACT AWARD AND EXECUTION

3-1.02 CONSIDERATION OF BIDS
3-1.02A General
For a lump sum based bid, the Department compares bids based on the total price.

For a unit price based bid, the Department compares bids based on the sum of the item totals.

For a cost plus time based bid, the Department compares bids based on the sum of the item totals and the total bid for time.

3-1.02B Tied Bids
The Department breaks a tied bid with a coin toss except:

1. If a small business bidder and a non–small business bidder request preferences and the reductions result in a tied bid, the Department awards the contract to the small business bidder.
2. If a DVBE small business bidder and a non-DVBE small business bidder request preferences and the reduction results in a tied bid, the Department awards the contract to the DVBE small business bidder.

Add to the end of section 3-1.04:

You may request to extend the award period by faxing a request to (916) 227-6282 before 4:00 p.m. on the last day of the award period. If you do not make this request, after the specified award period:

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

Replace the paragraph in section 3-1.11 with:

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

Replace section 3-1.12 with:

3-1.12 RESERVED
Replace section 3-1.13 with:

3-1.13 FORM FHWA-1273
For a federal-aid contract, form FHWA-1273 is included with the Contract form in the documents sent to the successful bidder for execution. Comply with its provisions. Interpret the training and promotion section as specified in section 7-1.11A.

Delete items 4 and 6 of the 2nd paragraph of section 3-1.18.

5 CONTROL OF WORK

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

and 100 or more working days

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

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

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

, including VECPs

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

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

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

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

field supervisory personnel

Replace section 5-1.13B with:

5-1.13B Disadvantaged Business Enterprises

5-1.13B(1) General
Section 5-1.13B applies to a federal-aid contract.

Use each DBE as listed on the DBE Commitment form unless you receive authorization for a substitution. Ensure that all subcontracts and agreements with DBEs to supply labor or materials are performed under 49 CFR 26.

Maintain records, including:

1. Name and business address of each 1st-tier subcontractor
2. Name and business address of each DBE subcontractor, DBE vendor, and DBE trucking company, regardless of tier
3. Date of payment and total amount paid to each business

If you are a DBE contractor, include the date of work performed by your own forces and the corresponding value of the work.

Before the 15th day of each month for the previous month's work, submit:

1. Monthly DBE Trucking Verification form
2. Monthly DBE Payment form

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. Upon work completion, complete a Disadvantaged Business Enterprises (DBE) Certification Status Change form. Submit the form within 30 days of Contract acceptance.

Upon work completion, complete a Final Report – Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors form. Submit it within 30 days of Contract acceptance. The Department withholds $10,000 until the form is submitted. The Department releases the withhold upon submission of the completed form.

5-1.13B(2) Performance of Disadvantaged Business Enterprises

Section 5-1.13(B)(2) applies if a DBE goal is shown on the Notice to Bidders.

DBEs must perform work or supply materials as listed on the DBE Commitment form.

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or those of an affiliate, a non-DBE firm, or another DBE firm or obtain materials from other sources without authorization from the Department.

The Department authorizes a request to use other forces or sources of materials if it shows any of the following justifications:

1. Listed DBE fails or refuses to execute a written contract based on the plans and specifications for the project.
2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
3. Work requires a contractor license and the listed DBE does not have a valid license under the Contractors License Law.
4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
5. Listed DBE’s work is unsatisfactory and not in compliance with the Contract.
6. Listed DBE is ineligible to work on the project because of suspension or debarment.
7. Listed DBE becomes bankrupt or insolvent.
8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.

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

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

If the Department authorizes the termination or substitution of a listed DBE, make good faith efforts to find another DBE. The substitute DBE must (1) perform at least the same amount of work as the original DBE under the Contract to the extent needed to meet the DBE goal and (2) be certified as a DBE with the work code applicable to the type of work the DBE will perform on the Contract at the time of your request for substitution. Submit your good faith effort documentation within 7 days of your request for authorization of the substitution. The Department may authorize a 7-day extension of this submittal period at your request. Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

Unless the Department authorizes a request to terminate or substitute a listed DBE, the Department does not pay for work unless it is performed or supplied by the DBE listed on the DBE Commitment form. You may be subject to other sanctions under 49 CFR 26.
Section 5-1.13C applies to a non-federal-aid contract.

Use each DVBE as shown on the Certified DVBE Summary form unless you receive authorization from the Department for a substitution. The substitute must be another DVBE unless DVBEs are not available, in which case, you must substitute with a small business. Any authorization for a substitute is contingent upon the Department of General Services’ approval of the substitute.

The requirement that DVBEs be certified by the bid opening date does not apply to DVBE substitutions after Contract award.

The Department authorizes substitutions for any of the reasons provided in 2 CA Code of Regs § 1896.73.

Include in your substitution request:
1. Copy of the written notice issued to the DVBE with proof of delivery
2. Copy of the DVBE's response to the notice
3. Name and certification number of the listed DVBE and the proposed substitute

Requests for substitutions of a listed DVBE with a small business must include documentation of the unavailability of DVBEs, including:
1. Contact with the small business/DVBE advocate from the Department and the Department of Veterans Affairs
2. Search results from the Department of General Services' website of available DVBEs
3. Communication with a DVBE community organization nearest the job site, if applicable
4. Documented communication with the DVBE and small businesses describing the work to be performed, the percentage of the total bid, the corresponding dollar amount, and the responses to the communication

The Department forwards your substitution request to the Department of General Services. The Department of General Services issues a notice of approval or denial. The Department provides you this notice.

If you fail to use a listed DVBE without an authorized substitution request, the Department issues a penalty of up to 10 percent of the dollar amount of the work of the listed DVBE.

Maintain records of subcontracts made with DVBEs. Include in the records:
1. Name and business address of each business
2. Total amount paid to each business

For the purpose of determining compliance with Pub Cont Code § 10115 et seq.:
2. Upon reasonable notice and during normal business hours, permit access to its premises for the purposes of:
   2.1. Interviewing employees.
   2.2. Inspecting and copying books, records, accounts and other material that may be relevant to a matter under investigation.

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

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

Replace section 5-1.20E with:

5-1.20E Water Meter Charges
Section 5-1.20E applies if a bid item for water meter charges is shown on the Bid Item List. The charges are specified in a special provision for section 5-1.20E.

The local water authority will install the water meters.
The charges by the local water authority include:

1. Furnishing and installing each water meter
2. Connecting to the local water authority's main water line, including any required hot tap or tee
3. Furnishing and installing an extension pipe from the main water line to the water meter
4. Sterilizing the extension pipe

Make arrangements and pay the charges for the installation of the water meters.

If a charge is changed at the time of installation, the Department adjusts the lump sum price based on the difference between the specified charges and the changed charges.

Replace section 5-1.20F with:

5-1.20F Irrigation Water Service Charges
Reserved

Add between the 2nd and 3rd paragraphs of section 5-1.23A:
Submit action and informational submittals to the Engineer.

Add between the 5th and 6th paragraphs of section 5-1.23B(1):
For a revised submittal, allow the same number of days for review as for the original submittal.

Delete the 1st sentence in the 10th paragraph of section 5-1.23B(2).

Add to the list in the 1st paragraph of section 5-1.36A:
10. Survey monuments

Add to section 5-1.36C:
If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property.
Prevent material, equipment, and debris from falling onto railroad property.

Add to section 5-1.36:

5-1.36E Survey Monuments
Protect survey monuments on and off the highway. Upon discovery of a survey monument not identified and located immediately:
1. Stop work near the monument
2. Notify the Engineer
Do not resume work near the monument until authorized.

Add between the 1st and 2nd paragraphs of section 5-1.37A:
Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.
Replace the 1st sentence of the 1st paragraph of section 5-1.39C(2) with:

Section 5-1.39C(2) applies if a plant establishment period of 3 years or more is shown on the Notice to Bidders.

Replace "working days" in the 1st paragraph of section 5-1.43E(1)(a) with:

original working days

6 CONTROL OF MATERIALS

6-2.05C Steel and Iron Materials

Steel and iron materials must be melted and manufactured in the United States except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or $2,500, materials produced outside the United States may be used if authorized

Furnish steel and iron materials to be incorporated into the work with certificates of compliance and certified mill test reports. Mill test reports must indicate where the steel and iron were melted and manufactured.

All melting and manufacturing processes for these materials, including an application of a coating, must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

Replace "Precast concrete members specified section 11-2" in the table in section 6-3.05B with:

Precast concrete members specified as tier 1 or tier 2 in section 90-4.01D(1)

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Replace "$50" in the 1st sentence in the 6th paragraph of section 7-1.02K(2) with:

$200

Replace "$25" in the 2nd sentence in the 13th paragraph of section 7-1.02K(3) with:

$100

Delete "water or" in the 9th paragraph of section 7-1.03.

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

25 days

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

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

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

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

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

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

8 PROSECUTION AND PROGRESS

Replace "working days" in the 1st paragraph of section 8-1.02B(1) with:

original working days

Replace "working days" at each occurrence in the 1st paragraph of section 8-1.02C(1) with:

original working days

Delete the 4th paragraph of section 8-1.02C(1).

Replace "Contract" in the 9th paragraph of section 8-1.02C(1) with:

work

Replace the 1st paragraph of section 8-1.02C(3)(a) with:

Submit a description of your proposed schedule software for authorization.

Delete the last paragraph of section 8-1.02C(3)(a).

Replace section 8-1.02C(3)(b) with:

8-1.02C(3)(b) Reserved
Delete the 3rd paragraph of section 8-1.02C(5).

Replace "Contract" in the last paragraph of section 8-1.02C(5) with:

"original"

Replace "working days" in the 1st paragraph of section 8-1.02D(1) with:

"original working days"

Replace "8-1.02D(1)" in the 2nd paragraph of section 8-1.02D(1) with:

"8-1.02C(1)"

Replace "Contract" in the 3rd paragraph of section 8-1.02D(2) with:

"work"

Replace "Contract" in item 9 in the list in the 4th paragraph of section 8-1.02D(4) with:

"work"

Replace "Contract completion" in the 4th paragraph of section 8-1.02D(6) with:

"work completion"

Replace "Contract working days" in the 4th paragraph of section 8-1.02D(6) with:

"original working days"

Delete items 1.3 and 1.4 in the list in the 1st paragraph of section 8-1.02D(10).

Replace the last paragraph of section 8-1.04B with:

The Department does not adjust time for starting before receiving notice of Contract approval.

Replace the 1st paragraph of section 8-1.05 with:

Contract time starts on the last day specified to start job site activities in section 8-1.04 or on the day you start job site activities, whichever occurs first.

Replace the 2nd paragraph of section 8-1.05 with:

Complete the work within the Contract time.

Delete "unless the Contract is suspended for reasons unrelated to your performance" in the 4th paragraph of section 8-1.05.

Replace the headings and paragraphs in section 8-1.06 with:

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

The Engineer may suspend work wholly or in part due to your failure to (1) fulfill the Engineer's orders, (2) fulfill a Contract part, or (3) perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur. The Department may provide for a 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.

Replace the 1st sentence in the 1st paragraph of section 8-1.07B with:

For a critical delay, the Department may make a time adjustment.

Add to the end of section 8-1.07C:

The Department does not make a payment adjustment for overhead incurred during non–working days that extend the Contract into an additional construction season.

Replace the 1st paragraph of section 8-1.07C with:

For an excusable delay that affects your costs, the Department may make a payment adjustment.

Replace "8-1.08B and 8-1.08C" in the 1st paragraph of section 8-1.10A with:

8-1.10B and 8-1.10C

Replace section 8-1.10D with:

8-1.10D Reserved

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

9 PAYMENT

Add to the list in the 1st paragraph of section 9-1.03:

3. Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

Replace item 1 in the 3rd paragraph of section 9-1.03 with:

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

Replace "10" in the last paragraph of section 9-1.03 with:

7

Replace "in" in the 3rd paragraph of section 9-1.04A with:

for

Add to the end of section 9-1.04A:

For nonsubcontracted work paid by force account for a contract with a TRO bid item, the markups are those shown in the following table instead of those specified in sections 9-1.04B–D:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Percent markup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>30</td>
</tr>
<tr>
<td>Materials</td>
<td>10</td>
</tr>
<tr>
<td>Equipment rental</td>
<td>10</td>
</tr>
</tbody>
</table>
Replace the heading and the 1st paragraph of section 9-1.04D(3) with:

9-1.04D(3) Equipment Not On the Job Site and Not Required for Original Contract Work
For equipment not on the job site at the time required to perform work paid by force account and not required for original Contract work, the time paid is the time the equipment is operated to perform work paid by force account and the time to return the equipment to its source when the work paid by force account is completed.

Replace item 2 in the 3rd paragraph of section 9-1.04D(3) with:

2. Operated less than 4 hours is paid as 1/2 day

Replace section 9-1.04D(4) with:

9-1.04D(4) Equipment Not On the Job Site and Required for Original Contract Work
For equipment not on the job site at the time required to perform work paid by force account and required for original Contract work, the time paid is the time:

1. To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to a location on the job site or its source when the work paid by force account is completed
2. Equipment is operated to perform work paid by force account

Delete ", Huntington Beach," in the 3rd paragraph of section 9-1.07A.

Replace the formula in section 9-1.07B(2) with:

\[ Q_h = HMATT \times X_a \]

Replace "weight of dry aggregate" in the definition of the variable \( X_a \) in section 9-1.07B(2) with:

total weight of HMA

Replace the formula in section 9-1.07B(3) with:

\[ Q_{rh} = RHMATT \times 0.80 \times X_{arb} \]

Replace "weight of dry aggregate" in the definition of the variable \( X_{arb} \) in section 9-1.07B(3) with:

total weight of rubberized HMA

Replace the heading of section 9-1.07B(4) with:

Hot Mix Asphalt with Modified Asphalt Binder

Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):

HMA

Replace the formula in section 9-1.07B(4) with:

\[ Q_{mh} = MHMATT \times \left( \frac{100 - X_{am}}{100} \right) \times X_{mab} \]
Replace "weight of dry aggregate" in the definition of the variable \( X_{ma,b} \) in section 9-1.07B(4) with:

\[ \text{total weight of HMA} \]

Replace the formula in section 9-1.07B(5) with:

\[ Q_{rap} =HMATT \times X_{aa} \]

Replace "weight of dry aggregate" in the definitions of the variables \( X_{aa} \) and \( X_{ta} \) in section 9-1.07B(5) with:

\[ \text{total weight of HMA} \]

Add after the variable definitions in section 9-1.07B(9):

\[ \text{The quantity of extender oil is included in the quantity of asphalt.} \]

Replace the headings and paragraphs in section 9-1.11 with:

9-1.11A General
Section 9-1.11 applies if a bid item for time-related overhead is included in the Contract. If a bid item for time-related overhead is included, you must exclude the time-related overhead from every other bid item price.

9-1.11B Payment Quantity
The TRO quantity does not include the number of working days to complete plant establishment work.

For a contract with a TRO lump sum quantity on the Bid Item List, the Department pays you based on the following conversions:

1. LS unit of measure is replaced with WDAY
2. Lump sum quantity is replaced with the number of working days bid
3. Lump sum unit price is replaced with the item total divided by the number of working days bid

9-1.11C Payment Inclusions
Payment for the TRO bid item includes payment for time-related field- and home-office overhead for the time required to complete the work.

The field office overhead includes time-related expenses associated with the normal and recurring construction activities not directly attributed to the work, including:

1. Salaries, benefits, and equipment costs of:
   1.1. Project managers
   1.2. General superintendents
   1.3. Field office managers
   1.4. Field office staff assigned to the project
2. Rent
3. Utilities
4. Maintenance
5. Security
6. Supplies
7. Office equipment costs for the project's field office

The home-office overhead includes the fixed general and administrative expenses for operating your business, including:

1. General administration
2. Insurance
3. Personnel and subcontract administration
4. Purchasing
5. Accounting
6. Project engineering and estimating

Payment for the TRO bid item does not include payment for:

1. The home-office overhead expenses specifically related to:
   1.1. Your other contracts or other businesses
   1.2. Equipment coordination
   1.3. Material deliveries
   1.4. Consultant and legal fees

2. Non-time-related costs and expenses such as mobilization, licenses, permits, and other charges incurred once during the Contract

3. Additional overhead involved in incentive/disincentive provisions to satisfy an internal milestone or multiple calendar requirements

4. Additional overhead involved in performing additional work that is not a controlling activity

5. Overhead costs incurred by your subcontractors of any tier or suppliers

9-1.11D Payment Schedule

For progress payments, the total work completed for the TRO bid item is the number of working days shown for the pay period on the Weekly Statement of Working Days.

For progress payments, the Department pays a unit price equal to the lesser of the following amounts:

1. Price per working day as bid or as converted under section 9-1.11B.
2. 20 percent of the total bid divided by the number of original working days

For a contract without plant establishment work, the Department pays you the balance due of the TRO item total as specified in section 9-1.17B.

For a contract with plant establishment work, the Department pays you the balance due of the TRO item total in the 1st progress payment after all non–plant establishment work is completed.

9-1.11E Payment Adjustments

The 3rd paragraph of section 9-1.17C does not apply.

The Department does not adjust the unit price for an increase or decrease in the TRO quantity except as specified in section 9-1.11E.

Section 9-1.17D(2)(b) does not apply except as specified for the audit report below.

If the TRO bid item quantity exceeds 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B, the Engineer may adjust or you may request an adjustment of the unit price for the excess quantity. For the adjustment, submit an audit report within 60 days of the Engineer's request. The report must be prepared as specified for an audit report for an overhead claim in section 9-1.17D(2)(b).

Within 20 days of the Engineer's request, make your financial records available for an audit by the State for the purpose of verifying the actual rate of TRO described in your audit. The actual rate of TRO described is subject to the Engineer's authorization.

The Department pays the authorized actual rate for TRO in excess of 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B.

The Department pays for 1/2 the cost of the report; the Contractor pays for the other 1/2. The cost is determined under section 9-1.05.

Replace the paragraphs of section 9-1.16D with:

9-1.16D(1) General

Section 9-1.16D applies if a bid item for mobilization is shown on the Bid Item List.

Payments for mobilization made under section 9-1.16D are in addition to the partial payments made under Pub Cont Code § 10261.
Section 9-1.16D(2) applies unless the Contract includes a special provision for section 9-1.16D(1) that specifies section 9-1.16D(3) applies.

9-1.16D(2) Mobilization for Projects Except for Those Over Water Requiring Marine Access

The Department makes partial payments for mobilization under Pub Cont Code § 10264(a) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(a)(5).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(a)(5) in the 1st payment after Contract acceptance.

9-1.16D(3) Mobilization for Projects Over Water Requiring Marine Access

The Department makes partial payments for mobilization under Pub Cont Code § 10264(b) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(b)(6).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(b)(6) in the 1st payment after Contract acceptance.

Delete "revised Contract" in item 1 of the 1st paragraph of section 9-1.16E(2).

Replace "3179" in the 1st paragraph of section 9-1.16E(4) with:

9000

Replace "2014" in the 1st paragraph of section 9-1.16F with:

2020

Replace the 2nd paragraph of section 9-1.17C with:

Submit either a written acceptance of the proposed final estimate or a claim statement postmarked or hand delivered before the 31st day after receiving the proposed final estimate.

Add between "the" and "final estimate" in the 1st sentence in the 3rd paragraph of section 9-1.17C:

proposed

Replace the 1st sentence in the 6th paragraph of section 9-1.17D(2)(b) with:

The CPA's audit must be performed as an examination-level engagement under the attestation engagements in the Government Auditing Standards published by the Comptroller General of the United States.

DIVISION II GENERAL CONSTRUCTION

10 GENERAL

Replace the headings and paragraphs in section 10 with:

10-1 GENERAL

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

10-1.03 TIME CONSTRAINTS
Reserved

10-1.04 TRAINING AND MEETINGS
Training and meetings are held at times and locations you and the Engineer agree to.

10-1.05–10-1.10 RESERVED

10-2 SUSTAINABLE DESIGN REQUIREMENTS

10-2.01 GENERAL
10-2.01A General
Reserved

10-2.01B–10-2.01H Reserved
10-2.02 CALGREEN TIER 1
10-2.02A–10-2.02H Reserved
10-2.03 LEED
10-2.03A–10-2.03H Reserved

10-3 RESERVED
Replace section 10-4 with:

10-4 WATER USAGE
Section 10-4 includes general specifications for your use of water for construction activities.

The Department encourages you to conserve water in all construction activities.

The Engineer notifies you of any (1) water shortage or (2) mandate from a local water authority to ration water. Within 10 days of the notification, submit a water conservation plan. The plan must include:

1. List of construction activities that require water
2. Measures you will implement for each activity to conserve water
3. Method for curing concrete other than the water method if included in the work
4. Dust palliative you will use for dust control

Any unavailability of water that delays a controlling activity is a material shortage.

Replace section 10-5 with:

10-5 DUST CONTROL
Section 10-5 includes general specifications for controlling dust resulting from the work.

Prevent and alleviate dust by:

1. Applying a dust palliative under section 18
2. Applying temporary soil stabilization under section 13-5
3. Managing material stockpiles under section 13-4.03C(3)

10-6 JOB SITE WATER CONTROL

10-6.01 GENERAL
Section 10-6 includes specifications for controlling water to provide a dry working area at the job site.
10-6.02 WATER-FILLED COFFERDAM
Reserved

10-6.03–10-6.10 RESERVED

10-7–10-20 RESERVED

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

11 QUALITY CONTROL AND ASSURANCE

07-19-13
Replace section 11-2 with:

11-2 RESERVED

Replace the table in the 3rd paragraph of section 11-3.01A with:

<table>
<thead>
<tr>
<th>AWS code</th>
<th>Year of adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1.1</td>
<td>2010</td>
</tr>
<tr>
<td>D1.3</td>
<td>2008</td>
</tr>
<tr>
<td>D1.4</td>
<td>2011</td>
</tr>
<tr>
<td>D1.5</td>
<td>2010</td>
</tr>
<tr>
<td>D1.6</td>
<td>2007</td>
</tr>
<tr>
<td>D1.8</td>
<td>2009</td>
</tr>
</tbody>
</table>

07-19-13

Replace "does" in the definition of "continuous inspection" in section 11-3.01B with:
do

07-19-13

Replace "gross nonconformance" and its definition in section 11-3.01B with:

gross nonconformance: Rejectable indications are present in more than 20 percent of the tested weld length.

07-19-13

Replace the introductory clause in the 1st paragraph of section 11-3.01C with:

Replace clause 6.1.3 of AWS D1.1, the 1st paragraph of clause 7.1.2 of AWS D1.4, and clause 6.1.2 of AWS D1.5 with:

Replace the 3rd paragraph of section 11-3.01C with:

For each inspection, including fit-up, WPS verification, and final weld inspection, the QC Inspector must confirm and document compliance with the specifications, AWS welding codes, and any referenced drawings.

07-19-13

Replace the paragraphs in section 11-3.01D with:

The Engineer has the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means determined by the Engineer. If welding will be performed without gas shielding, then qualification must also include welding without gas shielding.

Replace clause 6.14.6.1 of AWS D1.1, clause 7.8 of AWS D1.4, and clause 6.1.3.4 of AWS D1.5 with:

Personnel performing NDT must be qualified and certified under American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the written practice of the NDT firm. The written practice of the NDT firm must comply with or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Individuals who perform NDT, review the results, and prepare the written reports must be one of the following:
1. Certified NDT Level II technicians
2. Level III technicians certified to perform the work of Level II technicians

Replace the heading and the 1st through 3rd paragraphs of section 11-3.01E with:

11-3.01E  Weld Joint Details
If weld joint details proposed for use in the work are not prequalified under clause 3 of AWS D1.1 or figure 2.4 or 2.5 of AWS D1.5, submit the proposed WPS and the intended weld joint locations.

Upon authorization of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details must weld an additional qualification test plate using the WPS variables and the weld joint detail to be used in production. The test plate must:
1. Have the maximum thickness to be used in production and a minimum length of 18 inches.
2. Be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria must comply with the applicable AWS codes.

If a nonprequalified weld joint configuration is proposed using a combination of WPSs for work welded under AWS D1.1, you may conduct a single test combining the WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 4.5 of AWS D1.1.

Replace the 1st paragraph of section 11-3.01F with:

Replace paragraph 3 of clause 6.26.3.2 of AWS D1.5 with:
3. If indications that exhibit these planar characteristics are present at scanning sensitivity, or other evidence exists to suggest the presence of transverse cracks, a more detailed evaluation of the discontinuity by other means must be performed (e.g., alternate UT techniques, RT, grinding, or gouging for visual inspection or MT of the excavated areas.). For welds that have transverse cracks, excavate the full length of the crack plus 2 inches of weld metal on each side adjacent to the crack and reweld.

Replace "section" in the 2nd paragraph of section 11-3.01F with:

clause

Replace the 1st paragraph of section 11-3.02A with:

Except for stud welding, section 11-3.02 applies to (1) work welded under sections 49, 52, 55, and 75-1.03E and (2) work in section 99 that must comply with an AWS welding code.

Replace the 4th through 6th paragraphs of section 11-3.02C(2) with:

Submit an amended welding QC plan or an addendum to the welding QC plan for any changes to:
1. WPSs
2. NDT firms
3. QC personnel or procedures
4. NDT personnel or procedures
5. Systems for tracking and identifying welds
6. Welding personnel

Allow 15 days for the Engineer's review of an amended welding QC plan or an addendum to the welding QC plan.
Submit 7 copies of each authorized QC plan and any authorized addendums. Make 1 copy available at each location where work is performed.
Replace the 1st paragraph of section 11-3.02C(3) with:

Submit a welding report within 7 days following the performance of any welding. The welding report must include:

1. Daily production log for welding for each day that welding is performed
2. Reports of all visual weld inspections and NDT performed, whether specified, additional, or informational
3. Radiographs and radiographic reports, and other required NDT reports
4. Summary of welding and NDT activities that occurred during the reporting period
5. Reports of each application of heat straightening
6. Summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number
7. Documentation that you have:
   7.1. Evaluated all radiographs and radiograph reports and NDT and NDT reports
   7.2. Corrected all rejectable deficiencies and that all repaired welds have been reexamined using the required NDT and found acceptable
8. Reports or chart recordings of each application of any stress relieving used
9. Reports and chart recordings for any electroslag welding used

Add between "radiographic" and "envelopes" in the introductory clause in the 3rd paragraph of section 11-3.02C(3):

film

Delete the 3rd sentence in the 5th paragraph of section 11-3.02C(3).

Replace the introductory clause in the 1st paragraph of section 11-3.02D with:

Clauses 6.1.4.1 and 6.1.4.3 of AWS D1.1, the 2nd paragraph of clause 7.1.2 of AWS D1.4, clauses 6.1.3.1 through 6.1.3.3 of AWS D1.5, and clause 7.2.3 of AWS D1.8 are replaced with:

Replace items 1 and 2 in the list in the 2nd paragraph of section 11-3.02D with:

1. Work is welded at a permanent fabrication or manufacturing plant that is certified under the AISC Certification Program for Steel Bridge Fabricators, Intermediate Bridges, and Fracture-Critical Member endorsement if required.
2. Structural steel for building construction work is performed at a permanent fabrication or manufacturing plant that is certified under the AISC Quality Certification Program, Category STD, Standard for Steel Building Structures.

Delete the 3rd paragraph of section 11-3.02D.

Except for the exempt facilities identified above, an authorized independent third party must witness the qualification tests for welders or welding operators.

Replace the paragraph in section 11-3.02F with:

Welding procedures qualification for work welded under AWS D1.5 must comply with clause 5.12 or 5.12.4 of AWS D1.5 and the following:

1. Unless considered prequalified, qualify fillet welds in each position. Conduct the fillet weld soundness test using the essential variables of the WPS as established by the PQR.
2. For qualifying joints that do not comply with figures 2.4 and 2.5 of AWS D1.5, conduct the test complying with figure 5.3 using the welding parameters that were established for the test conducted complying with figure 5.1.

3. Macroetch tests are required for WPS qualification tests, and acceptance must comply with clause 5.19.3 of AWS D1.5.

4. If a nonstandard weld joint is to be made using a combination of WPSs, you may conduct a test under figure 5.3, combining the qualified or prequalified WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 5.3 of AWS D1.5.

5. Before preparing mechanical test specimens, inspect the PQR welds by visual and radiographic tests. The backing bar must be 3 inches in width and must remain in place during NDT. Results of the visual and radiographic tests must comply with clause 6.26.2 of AWS D1.5 excluding clause 6.26.2.2. All other requirements for clause 5.17 are applicable.

Add to the list in the 3rd paragraph of section 11-3.02G:

3. Repairs not included in the welding QC plan

Replace the 1st sentence of the 4th paragraph of section 11-3.02G with:

Requests to perform 3rd-time excavations, repairs of cracks, or repairs not included in the welding QC plan must include an engineering evaluation.

12 TEMPORARY TRAFFIC CONTROL

Replace the 5th paragraph of section 12-3.01A(1) with:

Repair or replace traffic-handling equipment and devices damaged from any cause during the Contract, including repainting if necessary. The condition of temporary traffic control devices must comply with the current American Traffic Safety Services Association publication "Quality Guidelines for Temporary Traffic Control Devices and Features."

Replace the 1st paragraph of section 12-3.01A(4) with:

Category 2 temporary traffic control devices must be on FHWA's list of acceptable, crashworthy Category 2 hardware for work zones. This list is available on FHWA's Safety Program Web site.

Replace "project" in the 4th paragraph of section 12-3.02C with:

work

Add after "Display" in item 4 in the list in the 2nd paragraph of section 12-3.03B:

or Alternating Diamond

Replace "project" in the 3rd paragraph of section 12-3.07C with:

work

Add to section 12-3:

12-3.18 AUTOMATED WORK ZONE INFORMATION SYSTEM
Reserved
12-3.19–12-3.25 RESERVED
Replace the 7th through 9th paragraphs of section 12-4.02A with:

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

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

Temporary pedestrian facilities must comply with section 12-7.

If an activity requires a closure of a walkway, another walkway must be made available nearby, off of the traveled way.

Delete the 12th paragraph of section 12-4.02A.

Replace section 12-4.03 with:

12-4.03 CLOSURE SCHEDULES AND CONDITIONS

12-4.03A General
Submit closure schedule requests and closure schedule amendments using LCS to show the locations and times of the requested closures.

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st lane closure request. The Department provides the training within 15 days after your request. The training may be web based.

Except for web-based training, the training is held at a time and location you and the Engineer agree to.

For web-based training, the Engineer provides you the website address to access the training.

Within 5 business days after completion of the training, the Department provides LCS accounts and user identifications to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

12-4.03B Closure Schedules
Every Monday by noon, submit a closure schedule request of planned closures for the next week period. The next week period is defined as Sunday noon through the following Sunday noon.

Submit a closure schedule request not less than 25 days and not more than 125 days before the anticipated start of any activity that reduces:

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

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

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

You will be notified through LCS of unauthorized closures or closures that require coordination with other parties as a condition for authorization.

The Engineer may reschedule a closure cancelled due to unsuitable weather.

If a closure is not opened to traffic by the specified time, suspend work. No further closures are allowed until the Engineer has reviewed and authorized a work plan submitted by you that ensures that future closures will be opened to traffic by the specified time. Allow 2 business days for review of your proposed work plan. The
Department does not compensate you for your losses due to the suspension of work resulting from the late opening of closures.

Notify the Engineer of delays in your activities caused by:

1. Your closure schedule request being denied although your requested closures are within the specified time frame allowed for closures. The Department does not compensate you for your losses due to amendments to the closure schedule that are not authorized.
2. Your authorized closure being denied.

If you are directed to remove a closure before the time designated in the authorized closure schedule, you will be compensated for the delay.

12-4.03C Contingency Plan

Section 12-4.03C applies 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 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 planned operations. For each activity, identify the critical event when the contingency plan will be activated.

Based on the Engineer's review, additional materials, equipment, workers, or time to complete activities from that specified in the contingency plan may be required.

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

Replace section 12-7 with:

12-7 TEMPERARY PEDESTRIAN FACILITIES

12-7.01 GENERAL

Section 12-7 includes specifications for constructing temporary pedestrian facilities.

Temporary pedestrian facilities must comply with the California MUTCD, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

Design temporary pedestrian facilities with protective overhead covering to support all imposed loads.

The design load and maximum allowable stresses for temporary pedestrian facilities with protective overhead covering must comply with section 48-2.01D(3). The minimum design live load for the temporary pedestrian facilities with protective overhead covering must be 150 psf for the entire structure.

The minimum width of the temporary pedestrian facilities with protective overhead covering between the inside face of handrails must be 60 inches. The clear height of the temporary pedestrian facilities with protective overhead covering measured from the floor surface to the canopy overhead must be at least 8 feet. Provide adequate lighting at all times. Lighting must comply with section 86-6.13.

Submit shop drawings with supporting calculations for temporary pedestrian facilities with protective overhead covering. Shop drawings and calculations must be signed by an engineer who is registered as a civil engineer in the State.

12-7.02 MATERIALS

Walkways must be surfaced with HMA, portland cement concrete, or wood. The surface must be skid resistant and free of irregularities.
Hand railings must be S4S lumber and painted white.

Protective overhead covering of temporary pedestrian facilities must be plywood at least 3/4 inch thick or wood planking with a nominal thickness of 2 inches minimum.

**12-7.03 CONSTRUCTION**

Construct hand railings on each side of a temporary pedestrian facility as necessary to protect pedestrian traffic from hazards due to work activities or adjacent vehicular traffic.

Maintain temporary pedestrian facilities in good condition and keep them clear of obstructions.

**12-7.04 PAYMENT**

Not Used

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**13 WATER POLLUTION CONTROL**

05-30-14

Delete item 3 in the list in the 4th paragraph of section 13-1.01A.

**Add to section 13-1.01A:**

Comply with the Department's general permit issued by the State Water Resources Control Board for Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans). The Department's general permit governs stormwater and nonstormwater discharges from the Department's properties, facilities, and activities. The Department's general permit may be viewed at the Web site for the State Water Resources Control Board, Storm Water Program, Caltrans General Permit.

**Add to the list in the 1st paragraph of section 13-1.01D(3)(b):**

3. Have completed SWRCB approved QSD training and passed the QSD exam

**Add to the list in the 2nd paragraph of section 13-1.01D(3)(b):**

3. Have completed SWRCB approved QSP training and passed the QSP exam

**Replace "NEL violation" in item 3.6.2 in the list in the 1st paragraph of section 13-1.01D(3)(c) with:**

receiving water monitoring trigger

**Replace the 1st paragraph in section 13-2.01B with:**

Within 7 days after Contract approval, submit 2 copies of your WPCP for review. Allow 5 business days for review.

After the Engineer authorizes the WPCP, submit an electronic copy and 3 printed copies of the authorized WPCP.

If the RWQCB requires review of the authorized WPCP, the Engineer submits the authorized WPCP to the RWQCB for its review and comment. If the Engineer orders changes to the WPCP based on the RWQCB’s comments, amend the WPCP within 3 business days.
Within 15 days of Contract approval, submit 3 copies of your SWPPP for review. The Engineer provides comments and specifies the date when the review stopped if revisions are required. Change and resubmit a revised SWPPP within 15 days of receiving the Engineer's comments. The Department's review resumes when a complete SWPPP has been resubmitted.

When the Engineer authorizes the SWPPP, submit an electronic copy and 4 printed copies of the authorized SWPPP.

If the RWQCB requires review of the authorized SWPPP, the Engineer submits the authorized SWPPP to the RWQCB for its review and comment. If the Engineer requests changes to the SWPPP based on the RWQCB's comments, amend the SWPPP within 10 days.

Replace "NELs" in item 3.1 in the 3rd paragraph of section 13-3.01B(2)(a) with:

receiving water monitoring triggers

13-3.01B(6)(c) Receiving Water Monitoring Trigger Report

Whenever a receiving water monitoring trigger is exceeded, notify the Engineer and submit a receiving water monitoring trigger report within 48 hours after conclusion of a storm event. The report must include:

1. Field sampling results and inspections, including:
   1.1. Analytical methods, reporting units, and detection limits
   1.2. Date, location, time of sampling, visual observation and measurements
   1.3. Quantity of precipitation from the storm event
2. Description of BMPs and corrective actions

The storm event daily average for storms up to the 5-year, 24-hour storm must not exceed the receiving water monitoring trigger for turbidity.

The daily average sampling results must not exceed the receiving water monitoring trigger for pH.
Delete "and NELs are violated" in the 3rd paragraph of section 13-3.03C.
Replace "working days" at each occurrence in section 13-3.04 with.
  original working days

Delete the 1st sentence in the 2nd paragraph of section 13-4.03C(3).
Add between the 2nd and 3rd paragraphs of section 13-4.03C(3):
  Manage stockpiles by implementing water pollution control practices on:
    1. Active stockpiles before a forecasted storm event
    2. Inactive stockpiles according to the WPCP or SWPPP schedule

Delete the 7th paragraph of section 13-4.03C(3).

Replace the heading of section 13-4.03E(1) with:
  General

Delete the 1st through 5th sentences in the 2nd paragraph of section 13-4.03E(1).

Replace the 1st sentence of the 1st paragraph of section 13-4.03E(3) with:
  Limit vehicle and equipment cleaning or washing at the job site to that needed for safety and protection of the equipment and compliance with PLACs.

Replace the paragraph in section 13-4.04 with:

Not Used

Replace "20-7.02D(6)" in section 13-5.02C with:
  20-5.03E

Delete "or stockpile" in the 3rd paragraph of section 13-5.02F.

Replace "20-7.03l(10)" in section 13-5.03C with:
  20-5.03E(3)

Replace section 13-5.03F with:
  13-5.03F  Reserved

Delete "or stockpile" in item 1 in the list in the 1st paragraph of section 13-5.03K.

Delete the 3rd paragraph of section 13-5.03K.
You may use any of the following systems for temporary concrete washout:

1. Temporary concrete washout facility
2. Portable temporary concrete washout
3. Temporary concrete washout bin

Replace the 2nd paragraph of section 13-9.01B with:
Retain and submit an informational submittal for records of disposed concrete waste.

Delete the 4th paragraph of section 13-9.01B.

Delete "if authorized" in the 1st sentence in the 1st paragraph of section 13-9.02A.

Replace "at least 3-inch" in the 3rd sentence in the 1st paragraph of section 13-9.02A with:

6-inch

14 ENVIRONMENTAL STEWARDSHIP

Replace section 14-9.03 with:

14-9.03 RESERVED

15 EXISTING FACILITIES

Replace section 15-1.03D with:

15-1.03D Reserved

Replace "metal beam guard railing" in the 1st paragraph of section 15-2.01C with:

guardrail

Replace the paragraphs of section 15-2.02B(1) with:
Section 15-2.02B includes specifications for removing pavement, base, subbase, and subgrade.
If only a portion of the pavement is removed, saw-cut the outline of the removal area on a neat line and with a power-driven saw before removing.
For asphalt concrete pavement, saw cuts must be at least 2 inches deep unless otherwise described.

Replace section 15-2.02B(4)(b) with:

15-2.02B(4)(b) Reserved
Add to section 15-2.02B:

15-2.02B(5) Remove Concrete Pavement
15-2.02B(5)(a) General
Remove only the portion of pavement to be replaced or repaired during the same lane closure. If there is overlying material on the concrete pavement, remove it with the pavement.

Do not impact the surface within 18 inches of the pavement to remain in place. Use removal methods that do not damage the remaining pavement and base. Slab-lifting equipment must attach to the pavement.

Instead of disposing of removed concrete pavement by removing it from the job site, you may dispose of it under section 15-3.01.

15-2.02B(5)(b) Saw Cuts
Saw cut using a diamond blade and make cuts perpendicular to the pavement surface. Saw cutting is not required where concrete pavement is adjacent to asphalt concrete pavement.

Saw cut (1) no more than 2 days before removing pavement and (2) such that traffic will not dislodge any pavement piece or segment. Saw cut perpendicular to the traveled way except you may cut parallel or diagonal to the traveled way when removing the pavement during the same lane closure as the saw cutting.

You may make additional saw cuts within the sawed outline.

Saw cuts must be the full depth of the pavement unless otherwise shown.

Saw cut at longitudinal and transverse joints to remove entire slabs. For partial-slab areas, the Engineer determines the exact saw-cut locations.

15-2.02B(5)(c) Reserved
15-2.02B(6) Reserved
15-2.02B(7) Payment
Reserved

Replace section 15-2.02G with:

15-2.02G Remove Guardrail
Where removing guardrail, remove any concrete anchors and steel foundation tubes.

Replace the 1st paragraph of section 15-2.02K with:

Box culverts, concrete pipes, inlets, headwalls, and endwalls must be completely removed if any portion of these structures is (1) within 3 feet of the grading plane in excavation areas, (2) within 1 foot of original ground in embankment areas, or (3) shown to be removed.

Replace "Metal beam guard railing" in the table in the 2nd paragraph of section 15-2.03A(2)(a) with:

Guardrail

Replace the heading of section 15-2.03B with:

Salvage Guardrail

Replace the heading of section 15-2.04D with:

Reconstruct Guardrail
Replace section 15-2.09D with:

15-2.09D Reserved

Replace the 4th paragraph of section 15-2.10B with:

Instead of using new materials similar in character to those in the existing structure, you may use raising devices to adjust a manhole to grade. Before starting paving work, measure and fabricate raising devices. Raising devices must:

1. Comply with the specifications for section 75 except that galvanizing is not required
2. Have a shape and size that matches the existing frame
3. Be match marked by painting identification numbers on the device and corresponding structure
4. Result in an installation that is equal to or better than the existing one in stability, support, and nonrocking characteristics
5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening

Replace the heading of section 15-2.10D with:

Adjust Guardrail

Replace the paragraphs of section 15-3.01 with:

Section 15-3 includes specifications for removing all or a portion of a concrete facility.

Concrete facilities include curbs, gutters, gutter depressions, sidewalks, driveways, slope paving, island paving, barriers, retaining walls, sound walls, minor structures, aprons, spillways, and dams.

Where broken-concrete slope protection is shown, use removed concrete for the construction of the broken-concrete slope protection.

Instead of disposing of removed concrete by removing it from the job site, you may dispose of it on the job site by one of the following methods:

1. Burying it in embankments at authorized locations. Removed concrete must be broken into pieces that can be readily handled and incorporated into embankments and placed at a depth of at least 3 feet below finished grade and slope lines. Concrete must not be buried in areas where piling is to be placed or within 10 feet of trees, pipelines, poles, buildings or other permanent objects or structures.
2. Placing it at authorized locations. The removed concrete must not present an unsightly appearance from the highway.

Replace the paragraph of section 15-3.02 with:

Not Used

Delete the 5th paragraph of section 15-3.03.

Add to the end of section 15-4.01A(2):

Allow 20 days for review of the bridge removal work plan.

Replace the 2nd sentence of the 3rd paragraph of section 15-4.02C(1) with:

Paint exposed ends of the remaining reinforcement with 2 applications of organic zinc-rich primer as specified for painting exposed ends of prestressing steel in section 50-1.03B(3).
Before starting deck rehabilitation activities, complete the removal of any traffic stripes, pavement markings, and pavement markers.

Perform the following activities in the order listed:
1. Abrasive blast the deck surface with steel shot. Perform abrasive blasting after the removal of any unsound concrete and placement of any rapid setting concrete patches.
2. Sweep the deck surface.
3. Blow the deck surface clean using high-pressure air.

Before removing asphalt concrete surfacing, verify the depth of the surfacing at the supports and midspans of each structure (1) in each shoulder, (2) in the traveled way, and (3) at the roadway crown, if a crown is present.

Delete "and concrete expansion dams" in the 3rd paragraph of section 15-5.01C(4).

For a contract with less than 60 original working days, submit certificates of compliance for the filler material and bonding agents.

For a contract with less than 60 original working days, alternative materials must be authorized before use.

The final surface finish of the patched concrete surface must comply with section 51-1.03F.

Delete the 4th paragraph of section 15-5.05C.

Replace "51-1.03F(5)" in the 3rd paragraph of section 15-5.06C(1) with:

Replace "51-1.03E(5)" in the 5th paragraph of section 15-5.06C(1) with:

Delete the 9th paragraph of section 15-5.06C(1).
Add between the 18th and 19th paragraphs of section 15-5.06C(1):

Texture the polyester concrete surface before gelling occurs by longitudinal tining under 51-1.03F(5)(b)(iii), except do not perform initial texturing.

Replace section 15-5.06C(2) with:

15-5.06C(2) Reserved

Delete the 3rd paragraph of section 15-5.06D.

Replace the 1st paragraph in section 15-5.07B(4) with:

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

Replace section 15-5.09 with:

15-5.09 POLYESTER CONCRETE EXPANSION DAMS
15-5.09A General
Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Reinforcement must comply with section 52.

15-5.09B Materials
Not Used

15-5.09C Construction
For new asphalt concrete overlays, place the asphalt concrete overlay before starting polyester concrete activities. Saw cut and remove asphalt concrete at expansion dam locations.

For existing asphalt concrete overlays, remove expansion dams and asphalt concrete to the limits shown. Removing expansion dams must comply with section 15-4 except a bridge removal work plan is not required.

Where a portion of the asphalt concrete overlay is to remain, saw cut a 2-inch-deep neat line along the edge to remain in place before removing the asphalt concrete. Do not damage the existing surfacing to remain in place.

Prepare the deck surface under section 15-5.01C(2).

You may use a mechanical mixer to mix the polyester concrete for expansion dams. The mixer capacity must not exceed 9 cu ft unless authorized. Initiate the resin and thoroughly blend it immediately before mixing it with the aggregate. Mix the polyester concrete for at least 2 minutes before placing.

The application rate of methacrylate resin must be approximately 100 sq ft/gal.

You may place and finish expansion dams using hand methods.

Protect expansion dams from moisture, traffic, and equipment for at least 4 hours after finishing.

For expansion dams over 6 feet long, install 1/4-inch-wide joint material at 6-foot intervals across the width of the expansion dam. Joint material must be either expanded polyurethane or expanded polyethylene.

15-5.09D Payment
Not Used
Add to section 15-6.01A(3)(a):

Within 5 days of completing annular space grouting at a culvert, submit the grouting records.

07-19-13

Replace "41-1.01" in item 10.3 in the list in the 2nd paragraph of section 15-6.01A(3)(d) with:

41-2

Replace "41-1.02" in 1st paragraph of section 15-6.01B(2) with:

41-2

Replace the heading of section 15-6.04 with:

01-18-13

INVERT PAVING

Replace the 1st paragraph of section 15-6.13A(1) with:

Section 15-6.13 includes specifications for installing machine spiral wound PVC pipeliners directly into the culvert.

Replace the heading of section 15-6.13B with:

07-19-13

Machine Spiral Wound PVC Pipeliners, Grouted

DIVISION III GRADING

16 CLEARING AND GRUBBING

07-19-13

Replace "20-3.03B(4)" in the 3rd paragraph of section 16-1.01 with:

20-2.02C(2)

Replace "20-1.03D" in the 2nd paragraph of section 16-1.03B with:

20-3.01C(2)

18 DUST PALLIATIVE

05-30-14

Replace section 18 with:

18 DUST PALLIATIVES

18-1.01 GENERAL

18-1.01A Summary

Section 18 includes specifications for applying dust palliatives.

The dust palliative must be any of the following:

1. Water
2. Dust suppressant
3. Dust control binder

Water must comply with section 17.

18-1.01B Definitions

Reserved
18-1.01C Submittals
If a dust suppressant or dust control binder is to be used, submit a dust treatment plan at least 15 days before starting job site activities. The dust treatment plan must include:

1. Product name and type
2. Manufacturer's name
3. Polymer emulsion type if synthetic polymer emulsion is used, including identification of:
   3.1. Individual components greater than 5 percent by volume in blends of polymers of different compositions
   3.2. Additives greater than 2 by volume
4. MSDS
5. Proposed methods for applying products
6. Application rates and number of passes
7. Required weather conditions for application, including ambient and surface temperatures, wind conditions, and allowable period before expected precipitation
8. Drying time or curing time required before traffic is allowed on the treated surface

Submit the manufacturer's instructions for the material to be used as an informational submittal.

Submit a certificate of compliance for the dust suppressant, dust control binders, and fibers.

For dust suppressants, include with the certificate of compliance:

1. Test results verifying compliance with the quality characteristic requirements in section 18-1.01D. The results must be from a test conducted within 6 months before the date of the certificate of compliance.
2. Test results from a test conducted within 2 years before the date of the certificate of compliance verifying compliance with the following environmental requirements:
   2.1. Maximum constituent concentration levels
   2.2. US EPA regulatory requirements for:
      2.2.1. Volatile organic compounds
      2.2.2. Semivolatile organic compounds
      2.2.3. Toxicity characteristic leaching
      2.2.3. Modified synthetic leaching procedure
   2.3. Aquatic toxicity

18-1.01D Quality Control and Assurance
Dust palliatives must comply with US EPA requirements and RWQCB requirements for soil stabilizers.

Dust suppressants must be tested by an EPA-accredited laboratory. Liquid chemical treatments must be tested before dilution. Solid products must be mixed with water to a 25 percent concentration before testing. The chemical constituent concentration for each dust suppressant must not exceed the maximum levels shown in the following table:

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Test method</th>
<th>Requirement maximum level (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td>Barium</td>
<td>EPA Method 200.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Cadmium</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Cadmium</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Lead</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>Mercury</td>
<td>EPA Method 245.1</td>
<td>0.05</td>
</tr>
<tr>
<td>Selenium</td>
<td>EPA Method 200.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>EPA Method 200.7</td>
<td>10.0</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>EPA Method 365.4</td>
<td>2500.0</td>
</tr>
<tr>
<td>Cyanide</td>
<td>EPA Method 335.4</td>
<td>0.2</td>
</tr>
</tbody>
</table>
Dust suppressants must comply with the US EPA requirements for the quality characteristics when tested under the test methods shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile organic compounds (VOC)</td>
<td>EPA Method 8260</td>
</tr>
<tr>
<td>Semivolatile organic compounds (SVOC)</td>
<td>EPA Method 8270</td>
</tr>
<tr>
<td>Toxicity characteristic leaching procedure</td>
<td>EPA Method 1311</td>
</tr>
<tr>
<td>Modified synthetic leaching procedure</td>
<td>EPA Method 1312</td>
</tr>
</tbody>
</table>

The aquatic toxicity for dust suppressant must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aquatic Toxicity Requirements</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic toxicity(\text{LC50}) (LC50 min, ppm)</td>
<td>ASTM E729 or EPA Method 600/4-90/027F and EPA Method 600/4-91/002</td>
<td>10</td>
</tr>
<tr>
<td>Aquatic toxicity(\text{LC50}) (rating)</td>
<td>ASTM E729 or EPA Method 600/4-90/027F and EPA Method 600/4-91/002</td>
<td>slightly toxic or better</td>
</tr>
<tr>
<td>Renal toxicity(\text{LC50}) (LC50 min, ppm)</td>
<td>ASTM E1295</td>
<td>10</td>
</tr>
<tr>
<td>Renal toxicity(\text{LC50}) (rating)</td>
<td>ASTM E1295</td>
<td>slightly toxic or better</td>
</tr>
</tbody>
</table>

\(a\)Using Ceriodaphnia dubia (water flea), Oncorhynchus mykiss (rainbow trout), Pimephales promelas (fathead minnow), and Americamysis bahia (mysid shrimp)

\(b\)Using Ceriodaphnia dubia (water flea)

18-1.02 MATERIALS

18-1.02A General

Dust suppressants and control binders must be either (1) miscible in water or (2) a material that is directly applied to the surface without mixing with water.

18-1.02B Dust Suppressants

18-1.02B(1) General

Dust suppressants must be one of the following:

1. Petroleum-based organic product
2. Nonpetroleum-based organic product
3. Hygroscopic product
4. Synthetic polymer emulsions

18-1.02B(2) Petroleum-Based Organic Products

Petroleum-based organic dust suppressants must be asphalt emulsion, petroleum resin, base oil, mineral oil, or synthetic fluid.

Asphalt emulsion must be Grade SS1h.

Petroleum resin must comply with the requirements shown in the following table:
### Petroleum Resin Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residue (min, %)</td>
<td>ASTM D6934</td>
<td>60</td>
</tr>
<tr>
<td>pH</td>
<td>ASTM D1429</td>
<td>4.0–7.0</td>
</tr>
<tr>
<td>Specific gravity at 16 °C (min)</td>
<td>ASTM D1298</td>
<td>1.00</td>
</tr>
<tr>
<td>Kinematic viscosity at 25 °C (min, Saybolt Furol seconds *)</td>
<td>ASTM D2170</td>
<td>188</td>
</tr>
<tr>
<td>Flash point (min °C)</td>
<td>ASTM D92</td>
<td>205</td>
</tr>
<tr>
<td>Particle charge test</td>
<td>ASTM D7402</td>
<td>Positive</td>
</tr>
</tbody>
</table>

*Use ASTM D2161 to convert the mm²/s value to Saybolt Furol seconds

### Base and Mineral Oils Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base and mineral oil content (min, %)</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>Specific gravity at 16 °C (min)</td>
<td>ASTM D1298</td>
<td>0.85–0.90</td>
</tr>
<tr>
<td>Brookfield absolute viscosity at 68 °C (max, cP)</td>
<td>ASTM D2196</td>
<td>250</td>
</tr>
<tr>
<td>Flash point (min, °C)</td>
<td>ASTM D93</td>
<td>150</td>
</tr>
</tbody>
</table>

### Synthetic Fluids Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base and mineral oil content (min, %)</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>Specific gravity at 16 °C (min)</td>
<td>ASTM D1298</td>
<td>0.85–0.90</td>
</tr>
<tr>
<td>Brookfield absolute viscosity at 68 °C (max, cP)</td>
<td>ASTM D2196</td>
<td>250</td>
</tr>
<tr>
<td>Flash point (min, °C)</td>
<td>ASTM D93</td>
<td>150</td>
</tr>
</tbody>
</table>

### Lignosulfonate Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lignin sulfonate content ready to use (min, %)</td>
<td>ASTM D4900</td>
<td>25</td>
</tr>
<tr>
<td>Residue total solids content (min %)</td>
<td>ASTM D4903 or D2834</td>
<td>52</td>
</tr>
<tr>
<td>Lignin sulfonate content of residue (min, %)</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>Reducing sugars content of residue (min, %)</td>
<td>ASTM D5896 or D6406</td>
<td>25</td>
</tr>
<tr>
<td>pH</td>
<td>ASTM D1293</td>
<td>6.0–9.0</td>
</tr>
<tr>
<td>Specific gravity (min)</td>
<td>ASTM D1429</td>
<td>1.20</td>
</tr>
<tr>
<td>Brookfield absolute viscosity at 25° C (max, cP)</td>
<td>ASTM D2196</td>
<td>1,000</td>
</tr>
</tbody>
</table>

18-1.02B(3) Nonpetroleum-Based Organic Products

Nonpetroleum-based organic dust suppressants must be lignosulfonate, plant oil, or tall oil pitch rosin.

Lignosulfonate must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lignin sulfonate content ready to use (min, %)</td>
<td>ASTM D4900</td>
<td>25</td>
</tr>
<tr>
<td>Residue total solids content (min %)</td>
<td>ASTM D4903 or D2834</td>
<td>52</td>
</tr>
<tr>
<td>Lignin sulfonate content of residue (min, %)</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>Reducing sugars content of residue (min, %)</td>
<td>ASTM D5896 or D6406</td>
<td>25</td>
</tr>
<tr>
<td>pH</td>
<td>ASTM D1293</td>
<td>6.0–9.0</td>
</tr>
<tr>
<td>Specific gravity (min)</td>
<td>ASTM D1429</td>
<td>1.20</td>
</tr>
<tr>
<td>Brookfield absolute viscosity at 25° C (max, cP)</td>
<td>ASTM D2196</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Plant oil must comply with the requirements shown in the following table:
Plant Oil Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residue active solids content (min, %)</td>
<td>ASTM D4903</td>
<td>50</td>
</tr>
<tr>
<td>Specific gravity (min)</td>
<td>ASTM D1429</td>
<td>0.93</td>
</tr>
<tr>
<td>Brookfield viscosity (cP)</td>
<td>ASTM D2196</td>
<td>48</td>
</tr>
</tbody>
</table>

Tall oil pitch rosin must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosin acid content (min, %)</td>
<td>ASTM D1240</td>
<td>10</td>
</tr>
<tr>
<td>Residue active solids content (min, %)</td>
<td>ASTM D2834</td>
<td>45</td>
</tr>
<tr>
<td>pH</td>
<td>ASTM D1293</td>
<td>3.0–9.0</td>
</tr>
<tr>
<td>Specific gravity (min)</td>
<td>ASTM D1429</td>
<td>1.00</td>
</tr>
<tr>
<td>Brookfield absolute viscosity at 25 °C (cP)</td>
<td>ASTM D2196</td>
<td>50–200</td>
</tr>
</tbody>
</table>

18-1.02B(4) Hygroscopic Products

Hygroscopic dust suppressants must be calcium chloride, calcium chloride flake, or magnesium chloride.

Calcium chloride must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium chloride content (%)</td>
<td>ASTM E449</td>
<td>28–42</td>
</tr>
<tr>
<td>Total magnesium as MgCl₂ (max, %)</td>
<td>ASTM E449</td>
<td>6.0</td>
</tr>
<tr>
<td>Total alkali chlorides as NaCl (max, %)</td>
<td>ASTM E449</td>
<td>6.0</td>
</tr>
<tr>
<td>Calcium hydroxide content (max, %)</td>
<td>ASTM E449</td>
<td>0.2</td>
</tr>
<tr>
<td>pH with 5 percent solution</td>
<td>ASTM D1293</td>
<td>7.0–9.0</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>ASTM D1429</td>
<td>1.28–1.44</td>
</tr>
</tbody>
</table>

Calcium chloride flake must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium chloride content (%)</td>
<td>ASTM E449</td>
<td>28–42</td>
</tr>
<tr>
<td>Total magnesium as MgCl₂ (max, %)</td>
<td>ASTM E449</td>
<td>6.0</td>
</tr>
<tr>
<td>Total alkali chlorides as NaCl (max, %)</td>
<td>ASTM E449</td>
<td>6.0</td>
</tr>
<tr>
<td>Calcium hydroxide content (max, %)</td>
<td>ASTM E449</td>
<td>0.2</td>
</tr>
<tr>
<td>pH with 5 percent solution</td>
<td>ASTM D1293</td>
<td>7.0–9.0</td>
</tr>
<tr>
<td>Gradation percent passing</td>
<td>ASTM C136</td>
<td></td>
</tr>
<tr>
<td>3/8–inch sieve</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>#4 sieve</td>
<td></td>
<td>80–100</td>
</tr>
<tr>
<td>#30 sieve</td>
<td></td>
<td>0–5</td>
</tr>
</tbody>
</table>

Magnesium chloride must comply with the requirements shown in the following table:
Magnesium Chloride Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium chloride content (%)</td>
<td>ASTM D4691 or ASTM D511(^a)</td>
<td>28–33</td>
</tr>
<tr>
<td>Sulfate content as magnesium sulfate (max, %)</td>
<td>ASTM D4691(^a)</td>
<td>4.0</td>
</tr>
<tr>
<td>Potassium content as potassium chloride (max, %)</td>
<td>ASTM E449</td>
<td>0.5</td>
</tr>
<tr>
<td>Sodium chloride content (max, %)</td>
<td>ASTM E449</td>
<td>1.0</td>
</tr>
<tr>
<td>pH with 5% solution</td>
<td>ASTM D1293</td>
<td>7.0–9.0</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>ASTM D1429</td>
<td>1.31 ± 0.02</td>
</tr>
</tbody>
</table>

\(^a\)You may use another appropriate atomic absorption spectrophotometry method such as that in Standard Methods for the Examination of Water and Waste Water by APHA-AWWA-WPCF.

18-1.02B(5) Synthetic Polymer Emulsions

Synthetic polymer emulsions must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residue active solids content (min, %)</td>
<td>ASTM D2834</td>
<td>40</td>
</tr>
<tr>
<td>pH</td>
<td>ASTM D1429</td>
<td>4.0–9.5</td>
</tr>
<tr>
<td>Specific gravity at 16 °C</td>
<td>ASTM D1298</td>
<td>1.00–1.15</td>
</tr>
<tr>
<td>Brookfield absolute viscosity (max, cP)</td>
<td>ASTM D2196</td>
<td>1,000</td>
</tr>
<tr>
<td>Polymer film tensile strength – dry (psi)</td>
<td>ASTM D412</td>
<td>500</td>
</tr>
<tr>
<td>Retained coagulum on #100 sieve (max, %)</td>
<td>ASTM D1417</td>
<td>0.1</td>
</tr>
<tr>
<td>Ash content (max, %)</td>
<td>ASTM D5040</td>
<td>2</td>
</tr>
</tbody>
</table>

18-1.02C Dust Control Binders

Dust control binders must comply with the specifications for a general purpose tackifier in section 21-1.02F(1).

Fibers must comply with section 21-1.02E.

18-1.03 CONSTRUCTION

18-1.03A General

Monitor dust conditions and apply dust palliative for dust control as described and as ordered. Reapply dust palliative at any time to control dust.

Apply a dust suppressant to:

1. Temporary haul roads
2. Construction staging, material storage, and layout areas
3. Compacted soil or aggregate base roads or driveways
4. Paved surfaces

Apply a dust control binder to:

1. Rough–graded soils
2. Completed slopes
3. Soil stockpiles unless another practice is already used

Do not use a dust suppressant or dust control binder within 100 feet of a wetland or body of water.
18-1.03B Equipment

Apply dust suppressants that are miscible in water with either (1) a pressure-type water distributor truck equipped with a spray system or (2) a pressure-type asphalt distributor truck as specified in section 93-1.03C.

Apply dust suppressant flakes to the surface using a spreader or spinner disk.

Apply dust control binders with either (1) a pressure-type water distributor truck equipped with a spray system or (2) hydraulic spray equipment as specified for applying hydromulch in section 21-1.03E.

18-1.03C Mixing and Application Rates

Use the mix proportions and application rate for the corresponding dust suppressant as shown in the following table:

<table>
<thead>
<tr>
<th>Dust suppressant</th>
<th>Mix proportions</th>
<th>Application rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltic emulsion, Grade SS1H</td>
<td>5 parts water to 1 part emulsion</td>
<td>0.20–1.0 gal/sq yd</td>
</tr>
<tr>
<td>Petroleum resin emulsion</td>
<td>5 parts water to 1 part emulsion</td>
<td>0.20–1.0 gal/sq yd</td>
</tr>
<tr>
<td>Base and mineral oil</td>
<td>Apply undiluted</td>
<td>0.30–0.35 gal/sq yd</td>
</tr>
<tr>
<td>Lignosulfonate</td>
<td>1 part water to 1 part concentrate</td>
<td>1.0 gal/sq yd</td>
</tr>
<tr>
<td>Plant oil</td>
<td>Apply undiluted</td>
<td>0.25–0.50 gal/sq yd</td>
</tr>
<tr>
<td>Tall oil pitch rosin</td>
<td>5 parts water to 1 part emulsion for clayey soil and 10 parts water to 1 part emulsion for sandy soil.</td>
<td>0.30–1.0 gal/sq yd</td>
</tr>
<tr>
<td>Calcium chloride solution (Hygroscopic)</td>
<td>Apply undiluted</td>
<td>0.20–0.35 gal/sq yd</td>
</tr>
<tr>
<td>Calcium chloride flakes (Hygroscopic)</td>
<td>--</td>
<td>1.0–1.5 lb/sq yd</td>
</tr>
<tr>
<td>Magnesium chloride (Hygroscopic)</td>
<td>Apply undiluted</td>
<td>0.30–0.50 gal/sq yd</td>
</tr>
<tr>
<td>Synthetic polymer emulsion</td>
<td>9 parts water to 1 part concentrate</td>
<td>0.50 gal/sq yd</td>
</tr>
</tbody>
</table>

Apply hygroscopic materials under the manufacturer’s instructions.

Apply calcium chloride flakes to a moist surface.

Allow surfaces treated with a dust suppressant to cure before opening to traffic.

Use the mix proportions and application rate for the corresponding dust control binder as shown in the following table:
### Dust control binder

<table>
<thead>
<tr>
<th>Dust control binder</th>
<th>Mix proportions</th>
<th>Application rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guar</td>
<td>11 to 15 pounds per 1,000 gallons of water</td>
<td>44–59 lb/acre</td>
</tr>
<tr>
<td>Psyllium</td>
<td>Enough water to allow for uniform slurry flow</td>
<td>80–200 lb/acre</td>
</tr>
<tr>
<td>Starch</td>
<td>Manufacturer's recommended mix proportions with water</td>
<td>150 lb/acre</td>
</tr>
<tr>
<td>Liquid acrylic copolymers and polymers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10 parts water to 1 part polymer</td>
<td>1,175 gal/acre</td>
</tr>
<tr>
<td>Liquid methacrylate and acrylate polymers</td>
<td>Manufacturer's recommended mix proportions with water</td>
<td>20 gal/acre</td>
</tr>
<tr>
<td>Copolymers of sodium acrylates and acrylamides</td>
<td>Manufacturer's recommended mix proportions with water</td>
<td>3–10 lb/acre</td>
</tr>
<tr>
<td>Polyanacrylamide and copolymer of acrylamide</td>
<td>10 pounds per 1,000 gallons of water</td>
<td>5 lb/acre</td>
</tr>
<tr>
<td>Hydro-colloid polymers</td>
<td>Manufacturer's recommended mix proportions with water</td>
<td>54–64 lb/acre</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mix and handle the polymeric compound in a manner that will not cause foaming. You may add an antifoaming agent.

Do not allow stormwater runoff from polyacrylamide treated soils unless water passes through:

1. Sediment basin if the total drainage area is greater than or equal to 5 acres.
2. Sediment trap or a series of check dams if the total drainage area is less than 5 acres. Maximize the number of check dams used and space them evenly in the drainage channel so as to maximize sediment settlement.

You may add fibers to dust control binders at a rate of 2,000 lb/acre.

You may use reduced application rates when reapplying dust palliatives if authorized.

### 18-1.04 PAYMENT

Not Used

### 19 EARTHWORK

10-17-14

Replace "20-3.03B(4)" in the 2nd paragraph of section 19-1.01A with:

20-2.02C(2)

Replace the 3rd paragraph in section 19-2.01A with:

Pavement removal within the limits of roadway excavation must comply with section 15-2.02B.

Delete the 2nd paragraph in section 19-2.03A.

Add to the 2nd paragraph of section 19-2.03D:

Topsoil must comply with section 21.
For cofferdams on or affecting railroad property, allow 85 days for review.

Add to the list in the 1st paragraph of section 19-3.01A(2)(d):

9. Provisions for discontinuous rows of soil nails

Replace "sets" in the 3rd and 4th paragraphs of section 19-3.01A(2)(d) with:

copies

Add to section 19-3.01A(3)(b):

For soil nail walls, wall zones are specified in the special provisions.
For ground anchor walls, a wall zone is the entire wall unless otherwise specified in the special provisions.

Delete the 2nd sentence in the 4th paragraph of section 19-3.01A(3)(b).

Replace "90" in the paragraph of section 19-3.02G with:

90-1

Add to section 19-3.02:

19-3.02I Filter Fabric
Filter fabric must be Class A.

Replace the heading of section 19-3.03C with:

19-3.03B(4) Cofferdams

Replace the heading of section 19-3.03D with:

19-3.03B(5) Water Control and Foundation Treatment

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

Add to the end of section 19-3.03E(3):

If filter fabric is shown behind the lagging:

1. Immediately before placing the filter fabric, remove any loose or extraneous material and sharp objects from the surface to receive the filter fabric.
2. Handle and place the filter fabric under the manufacturer's instructions. Stretch, align, and place the fabric without wrinkling.
3. Stitch the adjacent borders of filter fabric or overlap the adjacent borders by 12 to 18 inches. If stitching the border, use yarn of a contrasting color. Yarn size and composition must be as recommended by the fabric manufacturer. Use 5 to 7 stitches per inch of seam.
4. Repair any damaged filter fabric by placing a piece of filter fabric large enough to cover the damaged area and comply with the overlapping or stitching requirements.
Do not backfill over or place material over slurry cement backfill until 4 hours after placement. When concrete sand is used as aggregate and the in-place material is free draining, you may start backfilling as soon as the surface water is gone.

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

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

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

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

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

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

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

Structure excavation more than 0.5 foot from the depth shown is paid for as a work-character change if you request an adjustment or the Engineer orders an adjustment.

"Contract completion time" in the 8th paragraph of section 19-6.03D with:

work completion date

Add to section 19:

19-10–19-20 RESERVED

^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

20 LANDSCAPE

05-30-14

Replace the headings and paragraphs in section 20 with:

20-1 GENERAL
20-1.01 GENERAL

20-1.01A Summary
Section 20-1 includes general specifications for performing landscaping.

If an irrigation system is to be installed in an existing planting area to be maintained, check for plant deficiencies under section 20-3.02A(4) before starting irrigation work.

Perform a functional test for each irrigation system under 20-2.01A(4)(d):

1. Before planting the plants
2. After planting the plants
3. Before the start of the plant establishment work

If a plant is to be transplanted or an irrigation component is to be relocated, transplant plant or protect irrigation components before performing other construction activities in the area.

Perform roadside clearing:

1. As required to prepare the job site for construction work
2. Until the start of the plant establishment work or Contract acceptance, whichever comes first

20-1.01B Definitions
Reserved

20-1.01C Submittals
At least 15 days before applying any pesticide, submit a copy of the licensed pest control adviser's recommendation.

At the end of each week, submit a report documenting the application of all pesticides as an informational submittal. Use form Report of Chemical Spray Operations.

Before mixing a pesticide, submit a copy of the registered label for the pesticide as an informational submittal. If unable to copy, allow the Engineer to read the label on the container.

20-1.01D Quality Control and Assurance

20-1.01D(1) General
Obtain a recommendation from a licensed pest control adviser for the use of all pesticides under the Food & Agri Code. The recommendation must include the pesticides to be used, rates of application, methods of application, and application areas.

The pesticide applicator must have an active and valid qualified applicator license or certificate from the Department of Pesticide Regulation.

20-1.01D(2) Progress Inspections
The Engineer will perform progress inspections before:

1. Cultivating work starts
2. Pressure testing of irrigation pipe on the supply side of control valves
3. Testing of low voltage conductors
4. Planting work starts
5. Completion of planting work

Notify the Engineer at least 4 business days before each inspection is required. Allow at least 3 business days for the Engineer's inspection.

Unless otherwise authorized, do not proceed with the next construction activity until the inspection has been completed and any required corrective work has been performed and authorized.

20-1.02 MATERIALS

20-1.02A General
Reserved
20-1.02B Water
Water available from an existing Department-owned facility within the project limits or an irrigation system to be installed under the Contract is furnished at no charge.

If water is not available, make arrangements for supplying water. Water must be of a quality that will promote plant growth.

20-1.02C Pesticides
Pesticides must comply with the Department of Pesticide Regulation.
Insecticide must be imidacloprid.
Rodenticides must be brodifacoum, bromadiolone, or diphacinone.

Do not use oil or pelleted forms of pesticides for weed control.

For weed control, use a pesticide with a photosensitive dye that produces a contrasting color when sprayed on the ground. The color must disappear between 2 to 3 days after being applied. The dye must not stain surfaces or injure plants or wildlife when applied at the manufacturer's recommended application rate.

20-1.03 CONSTRUCTION
20-1.03A General
Take precautions to prevent irrigation water from:
1. Wetting vehicles, pedestrians, and pavement
2. Eroding soil
3. Causing excess runoff

Water plants under the Model Water Efficient Landscape Ordinance, 23 CA Code of Regs § 490 et seq., and local water agency requirements.

Water plants at night unless otherwise authorized.

Dispose of removed, pruned, and damaged vegetative material.

You may reduce removed vegetative material to chips with a maximum thickness of 1/2 inch and spread within the job site at locations determined by the Engineer. Chipped material must not be substituted for wood mulch, nor must the chipped material be placed within areas to receive wood mulch.

20-1.03B Pesticides
Notify the Engineer of pesticide application times at least 24 hours before each application.

Mix and apply pesticides under the requirements of the Department of Pesticide Regulation and the instructions on the pesticide product label.

Do not apply pesticides:
1. On Saturdays and holidays unless authorized
2. Whenever weather and wind conditions are unsuitable for application
3. Within the plant basin
4. On the foliage and woody parts of the plant

If a granular preemergent is used, it must be covered with mulch on the same work day. Do not apply granular preemergent in plant basins.

Do not apply preemergents:
1. To groundcover plants before the plants have been planted a minimum of 3 days and have been thoroughly watered
2. Within 18 inches of trees, shrubs, and seeded areas
20-1.03C  Roadside Clearing

20-1.03C(1)  General
Perform roadside clearing by:

1. Removing and disposing of trash and debris
2. Controlling the following pests:
   2.1. Rodents
   2.2. Insects
   2.3. Weeds
3. Removing existing plants as described

Control rodents by using rodenticides or traps.

20-1.03C(2)  Remove Existing Plants
Remove existing plants as described. Removal of existing plants includes removing their stumps and roots 2 inches or larger in diameter to a minimum depth of 12 inches below finished grade. Backfill holes resulting from stump removal to finished grade with material obtained from adjacent areas.

If a plant is to be planted within existing groundcover area, remove existing groundcover from within an area 6 feet in diameter centered at each plant location.

20-1.03C(3)  Weed Control
Control weeds by the use of pesticides, hand pulling, or mowing.

If pesticides are used to control weeds, apply pesticides before the weeds reach the seed stage of growth or exceed 4 inches in length, whichever occurs first. Do not use pesticides at cutting plant locations.

Where cuttings are to be planted, control weeds by hand pulling within an area 2 feet in diameter centered at each plant location.

If weeds are to be controlled by hand pulling, hand pull weeds before they reach the seed stage of growth or exceed 4 inches in length, whichever occurs first.

Where liner, plug, or seedling plants are to be planted 10 feet or more apart, control weeds by the use of pesticides or hand pulling within an area 2 feet in diameter centered at each plant location. Where liner, plug, or seedling plants are to be planted less than 10 feet apart, control weeds by the use of pesticides within the entire area.

Control weeds by mowing outside of mulched areas, plant basins, groundcover areas, and within areas to be seeded. Mowing must extend to the edges of pavement, dikes, curbs, sidewalks, walls, and fences.

If mowing is to be performed within areas to be seeded, perform mowing as needed until the start of the seeding operation specified in section 21.

Mowing must be performed before the weeds reach the seed stage of growth or exceed 6 inches in length, whichever occurs first. Mow weeds to a height of 3 inches.

20-1.03C(4)  Disposal of Removed Groundcover, Weeds, and Mowed Material
Dispose of hand pulled weeds the same day they are pulled. Dispose of removed groundcover within 3 days.

Dispose of mowed material from the initial mowing. Disposal of material from subsequent mowing is not required.

20-1.03D  Cultivation
Cultivation must be by mechanical methods and performed until the soil is in a loose condition to a minimum depth of 6 inches. Soil clods must not be larger than 2 inches in maximum dimension after cultivation.

The areas to be cultivated must extend 12 inches beyond the outer limit of each planting area requiring cultivation.

After initial cultivation, place soil amendment and fertilizer at specified rates.

Recultivate to thoroughly mix native soil and amendments.
Do not drive on cultivated areas after cultivation.

Planting areas that have been cultivated and become compacted must be recultivated.

Rocks and debris encountered during soil preparation in planting areas must be brought to the surface of the ground.

Remove rocks and debris as ordered. This work is change order work.

20-1.03E Weed Germination
Reserved

20-1.04 PAYMENT
Items paid for by area are measured parallel to the ground surface.

Planting areas that do not require cultivation but are within the cultivation areas will not be deducted.

20-2 IRRIGATION

20-2.01 GENERAL
20-2.01A General
20-2.01A(1) Summary
Section 20-2 includes specifications for installing irrigation systems.

The irrigation systems shown are diagrammatic.

20-2.01A(2) Definitions
Reserved

20-2.01A(3) Submittals
20-2.01A(3)(a) General
Submit shop drawings for the electrical components of the irrigation system except electrical service 30 days before installation. The drawings must:

1. Include schematic wiring diagrams showing wire sizes and routes between electrical components
2. Show conduit sizes
3. Bear the written approval of the controller manufacturer or the manufacturer's authorized agent
4. Be accompanied by:
   4.1. Colored wire and splice samples
   4.2. Manufacturer's descriptive and technical literature

After the work shown on the drawing is complete, submit 3 copies of the as-built shop drawings including any wire modifications for each controller installed.

For each controller, laminate and place in an envelope 1 copy of:

1. As-built schematic wiring diagram including wiring modifications
2. 11 by 17 inches as-built irrigation plan

The laminate must be clear, mat-finished plastic that is at least 10 mils thick. The envelope must be heavy-duty plastic.

Attach the envelope to the inside of the controller enclosure or cabinet door. If the door is not large enough to secure the envelope, submit the envelope and its contents.

20-2.01A(3)(b) Manufacturer's Instructions
Submit as an informational submittal the manufacturer's installation instructions 15 days before installing:

1. Couplings for conduits used for irrigation conduits
2. Plastic pipe and fittings
3. Solvent cement for plastic pipe and flexible hose
4. Sprinklers
5. Flow sensors

20-2.01A(3)(c) Maintenance and Operation Manuals
Before Contract acceptance, submit as an informational submittal a manufacturer's maintenance and operation manual for each type of controller installed.

20-2.01A(4) Quality Control and Assurance
20-2.01A(4)(a) General
Reserved

20-2.01A(4)(b) Pressure Testing
20-2.01A(4)(b)(i) General
Perform pressure testing for leakage on irrigation supply lines:

1. In the Engineer's presence
2. On business days between 8 a.m. and 5 p.m. unless authorized
3. Before backfilling supply line trenches
4. With irrigation system gate valves open
5. With open ends of the supply line and fittings plugged or capped

Notify the Engineer at least 48 hours before performing a pressure test.

Choose either Method A or B to test supply lines installed by trenching and backfilling and supply lines that are completely visible after installation.

All other supply lines, including those installed in the ground by methods other than trenching and backfilling must be tested by Method A.

Test irrigation supply line in conduit by Method A with the testing period modified to 0.5 hour and no allowable pressure drop.

20-2.01A(4)(b)(ii) Method A
Method A pressure testing procedures for leakage must comply with the following:

1. Pressure gauge must be calibrated from 0 to 200 psi in 5 psi increments and be accurate to within a tolerance of 2 psi.
2. Supply line must be filled with water and connected to a pressure gauge. Place the pipeline under a pressure of 125 psi. Remove the source of pressure and leave the line under the required pressure.
3. Test the supply line under the required pressure for a period of 1 hour. The pressure gauge must remain in place until each test period is complete.
4. Leaks that develop in the tested portion of the system must be located and repaired after each test period if a drop of more than 5 psi is indicated by the pressure gauge. After the leaks have been repaired, repeat the 1 hour pressure test until the drop in pressure is 5 psi or less.

If a system consists of a new supply line connected to an existing line, the new supply line must be isolated from the existing line and tested.

20-2.01A(4)(b)(iii) Method B
Method B pressure testing procedures for leakage must comply with the following:

1. Before any portion of the supply line on the upstream side of a control valve is backfilled, water must be turned on for that portion of the line and maintained at full pressure from the water source for a period not less than 8 consecutive hours after all air has been expelled from the line. Before any portion of the supply line on the downstream side of the control valve is backfilled, perform the same test for a period not less than 1 hour.
2. Repair leaks that develop in the tested portion of the system. After the leaks have been repaired, repeat the pressure test until no leaks occur as determined by the Engineer.

20-2.01A(4)(c) Sprinkler Coverage Check
After installation of the sprinklers, check and adjust the entire sprinkler system for proper orientation and uniform coverage.
20-2.01A(4)(d) Irrigation System Functional Tests
The functional tests for each irrigation controller or group of controllers and associated irrigation system served by a single electric service point must consist of at least 1 complete cycle of operation. The Engineer determines the length of the cycle.

Notify the Engineer at least 10 days before performing each functional test.

20-2.01A(4)(e) Final Irrigation System Check
Perform the final check of the existing and new irrigation system between 20 and 30 days before Contract acceptance. The Engineer determines the length of the cycle.

Remote control valves connected to existing and new irrigation controllers must be checked for automatic operation when the controllers are in automatic mode.

20-2.01B Materials
20-2.01B(1) General
Use minor concrete for replacing removed concrete facilities.

HMA for replacing removed asphalt concrete surfacing and facilities must comply with section 39. You may use minor HMA if authorized.

20-2.01B(2) Garden Valves
Each garden valve must:
1. Be inverted nose type and of brass or bronze construction with female thread inlet
2. Have a replaceable seat washer, rising valve stem within a protective collar, and male thread hose outlet
3. Have a loose key handle

20-2.01B(3) Recycled Water Identification
Irrigation components used for recycled water must be manufactured or painted purple. Recycled water irrigation pipe and tubing must have a permanent label with the wording "CAUTION RECYCLED WATER" every 24 inches in 2 rows spaced approximately 180 degrees apart in the longitudinal direction of the pipe or tubing.

The recycled water warning sign must be a decal or a decal attached to a 1/16-inch thick aluminum plate or tag.

Each warning sign decal must:
1. Show the phrase "Recycled Water, Do Not Drink" and the drinking glass graphic symbol
2. Be UV fade and weather resistant and manufactured from flexible vinyl with or without mylar
3. Have a purple background, black text, and self-adhesive backing

Each warning tag must:
1. Show the phrase "RECYCLED WATER" and the drinking glass graphic symbol
2. Be UV fade and weather resistant
3. Be purple, double-sided, and manufactured from polyurethane
4. Have an integral neck attachment and attachment hole capable of withstanding 178 lb of pull-out resistance
5. Have hot-stamped black lettering

Posts and hardware for warning signs must comply with section 56-4.

Concrete sprinkler protectors used with recycled water must be painted purple.

20-2.01B(4) Location Markers
Location markers must be schedule 40 white PVC plastic pipe.

20-2.01B(5) Pull Boxes
Pull boxes must comply with section 86-2.06 and be no. 5 or larger unless otherwise shown. Pull boxes for low voltage conductors must not have side openings.

Pull box covers used solely for irrigation electrical service must be marked "IRRIGATION".
20-2.01B(6) Unions
Unions must be brass or malleable iron capable of withstanding the maximum required working pressure.

20-2.01B(7) Valve Boxes and Covers
Valve boxes must be precast concrete.

Covers must be:
1. Concrete, steel, or cast iron.
2. Marked "WATER" in cast-in letters not less than 1 inch high.
3. 1 piece, except 2 pieces are required when the weight of the valve box cover exceeds 35 lb.

The valve box covers must include a polyurethane label with the appropriate controller letter and station number as shown.

20-2.01B(8) Wye Strainers
Wye strainers must:
1. Have a cast iron or all bronze body
2. Have a removable stainless steel strainer screen:
   2.1. With an open area equal to at least 3 times the cross-sectional area of the pipe based on an iron pipe size
   2.2. With 40-mesh woven wire, except:
      2.2.1. For a backflow preventer assembly, the screen must be 20-mesh woven wire mesh or perforated sheet with 0.045-inch diameter holes
      2.2.2. For a valve assembly, the screen must be 80-mesh woven wire mesh
3. Be capable of withstanding a working pressure of 150 psi
4. Be equipped with a garden valve at the outlet

The wye strainer filter housing must:
1. Withstand a working pressure of 150 psi
2. Be manufactured of reinforced polypropylene plastic

20-2.01C Construction

20-2.01C(1) General
Immediately shut off water to broken supply lines, valves, or sprinkler assemblies. Repair irrigation systems within 24 hours after a malfunction or damage occurs.

Connect underground metallic pipes, valves, or fittings made of dissimilar metals through a dielectric coupling or bushing.

You may install conduits, conductors, and supply lines by methods other than trenching provided that they are not damaged and are installed at the depths specified.

20-2.01C(2) Trenching and Backfilling
Trench and backfill under section 86-2.01.

Remove plants under 20-1.03C as necessary to perform trenching. If plants are to remain, adjust trench alignment to minimize damage.

If removal of:
1. Turf is required, remove to a maximum width of 12 inches.
2. Groundcover is required, remove to a maximum width of 6 feet. Existing Carpobrotus and Delosperma may be rototilled if the backfill for the trenches does not contain plants longer than 6 inches in length.

Make a 2-inch deep sawcut along neat lines around the perimeter of the pavement to be removed at locations determined by the Engineer.
The trench must have uniform bearing throughout the entire length and must be free of jagged rubble or sharp objects. Ensure conduit, supply line, and joints are not moved or damaged by backfill operations.

For a project with multiple water service points, excavate and backfill trenches for 1 service point at a time.

For irrigation supply lines and conduits 3 inches and larger be 5 times the pipe or conduit diameter deep and 2 times the pipe or conduit diameter wide.

For irrigation supply lines and conduits 2-1/2 inches or less in diameter must be a minimum of 12 inches below finished grade, measured from the top of the installed pipe.

Trenches must be at least 4 feet from curbs, dikes, and paved shoulders.

Rocks and debris encountered during trenching operations must be brought to the surface of the ground. Remove rocks and debris as ordered. This work is change order work.

If trenching requires the removal of plants, in areas with:
1. Turf, replace turf with sod under section 20-3.03C(3)(e).
2. Groundcover, replace groundcover plants from flats and plant at 12 inches on center under section 20-3.03C. No replacement of *Carpobrotus* and *Delosperma* is required if removed by rototilling.

Where existing surfacing is removed, replace the structural section to match the materials removed. Replacement concrete must be of uniform smoothness, color, and texture equal to the adjacent concrete surface. Dispose of removed material. Install supply line and conduits at the bottom of trenches and backfill with sand to a depth of 2 inches over the top of the supply lines and conduits. Excluding the part of the trench backfilled with surfacing or pavement, the remainder of the trench must be backfilled with material that is excavated from the trench. Rock, broken concrete, asphalt concrete and other particles larger than 2 inches in greatest dimension must not be used.

**20-2.01C(3) Pull Boxes**
Install pull boxes under section 86-2.06 at the following locations:

1. At all conductor splices except splices made in valve boxes
2. Within 5 feet of irrigation controllers
3. At ends of electrical conduits
4. At other locations shown

**20-2.01C(4) Valve Boxes and Covers**
Install and identify each valve box as shown.

In walkways and paved areas, install the top of the valve box flush with the surrounding finished grade.

**20-2.01C(5) Recycled Water Warning Signs**
Install recycled water warning signs on irrigation facilities using recycled water.

Install sign decals directly to clean, smooth surfaces. Clean the surface with alcohol or an equivalent cleaner before applying the decal.

Install a 4 by 4 inch warning sign decal to each:

1. Backflow preventer assembly
2. Irrigation controller enclosure cabinet door

Install a 2 by 2 inch warning tag to the each remote control valve and valve box cover.

Install a 2-1/2 by 3 inches sign decal to each sprinkler riser.
Under local regulations, install a 12 by 12 inch warning sign decal on an aluminum plate and attach to gates, fences, and walls located in the vicinity of a recycled water irrigation system. On gates and fences, install signs with S hooks and C clips or 14-gauge galvanized steel wire. On concrete walls or other rough surfaces, install signs with a silicon-based adhesive.

20-2.01C(6) Garden Valves
Furnish 3 keys for each garden valve before Contract acceptance.

20-2.01D Payment
Not Used

20-2.02 EXISTING IRRIGATION FACILITIES
20-2.02A General
20-2.02A(1) Summary
Section 20-2.02 includes specifications for checking, testing, operating, replacing, and relocating existing irrigation facilities.

20-2.02A(2) Definitions
Reserved

20-2.02A(3) Submittals
Submit a list of irrigation system deficiencies within 7 days after checking the existing facilities.

20-2.02A(4) Quality Control and Assurance
After irrigation facilities have been relocated, demonstrate in the presence of the Engineer that the relocated facilities function properly.
Certify each existing backflow preventer under section 20-2.03A(4).

20-2.02B Materials
Valve box covers must be the same size as the covers they replace.
Control and neutral conductors must be the same size and color as the control and neutral conductors they replace.

20-2.02C Construction
20-2.02C(1) General
Notify the Engineer at least 4 business days before shutting off the water supply to any portion of the existing irrigation system and immediately after restoring the water supply to any portion of the existing irrigation system.
If an irrigation facility to be relocated is determined unsuitable by the Engineer, replace irrigation facility under section 20-2. This work is change order work.

20-2.02C(2) Check and Test Existing Irrigation Facilities
Before performing irrigation system work, check existing irrigation facilities to remain in place or to be relocated. The Engineer determines the test watering cycle lengths. Check for deficiencies including missing parts, damaged components, and improper operation. Correct deficiencies as ordered. The correction of deficiencies is change order work.

20-2.02C(3) Operate Existing Irrigation Facilities
If the Contract includes a bid item for operate existing irrigation facilities, after performing work under section 20-2.02C(2), operate existing irrigation facilities through Contract acceptance.
Operate existing irrigation facilities except for water meters, underground supply lines, control and neutral conductors, and electrical conduits.
Check for proper operation at least once every 30 days. Adjust, repair, or replace existing irrigation facilities within 7 days of finding any deficiency.
Operate irrigation systems using the automatic irrigation controller until Contract acceptance. You may operate irrigation controllers manually during plant replacement, fertilization, weed germination, and repair work.

Program the irrigation controllers for seasonal requirements.

20-2.02C(4) Replace Valve Box Covers
Existing valve box covers shown to be replaced must remain in place until the new covers are ready to be installed.

Dispose of removed valve box covers.

20-2.02C(5) Relocate Backflow Preventer Assemblies
Relocate backflow preventer assembly as shown and install under section 20-2.03C.

20-2.02C(6) Relocate Water Meters
Relocate water meter as shown.

20-2.02C(7) Relocate Irrigation Controllers
Relocate irrigation controller as shown and install under section 20-2.07C.

20-2.02D Payment
Not Used

20-2.03 BACKFLOW PREVENTER ASSEMBLIES

20-2.03A General

20-2.03A(1) Summary
Section 20-2.03 includes specifications for installing a backflow preventer assembly.

20-2.03A(2) Definitions
Reserved

20-2.03A(3) Submittals
Reserved

20-2.03A(4) Quality Control and Assurance
Each backflow preventer assembly must be certified by a backflow preventer tester. The tester must have an active and valid certification from the water purveyor having jurisdiction.

If the local water purveyor does not have a certification program, the tester must be certified by AWWA or a nearby county with a certification program.

Notify the Engineer at least 5 business days before certifying backflow preventer assembly.

Certify each backflow preventer assembly annually and within 10 days before Contract acceptance.

20-2.03B Materials

20-2.03B(1) General
Each backflow preventer assembly must include:

1. Backflow preventer including gate valve, wye strainer, brass or malleable iron unions, fittings, and supports
2. Blanket
3. Enclosure
4. Concrete pad

Concrete for the pad must be minor concrete, except the concrete must not contain less than 463 pounds of cementitious material per cubic yard. Hand mixing of the concrete is allowed.

20-2.03B(2) Backflow Preventers
Each backflow preventer must:

1. Be reduced-pressure principle type.
2. Comply with the requirements of the water purveyor that has jurisdiction.
3. Be factory-assembled with:
   3.1. 2 check valves
   3.2. 1 pressure differential relief valve
   3.3. 4 test cocks
   3.4. 2 shut-off valves manufactured from iron or bronze. Shut-off valves must be one of the following:
       3.4.1. Resilient wedge gate valves
       3.4.2. Resilient seated and fully ported ball valves
       3.4.3. Resilient seated butterfly valves

Backflow preventer components must be capable of withstanding a working pressure of 150 psi.

20-2.03B(3) Backflow Preventer Blankets
Each backflow preventer blanket must:
1. Be polyester fabric coated with vinyl or polymeric resin
2. Be resistant to UV light, water, mildew, and fire
3. Have an R-value from R-30 to R-38

Blankets must have a securing mechanism that includes either zippers, hook-pile tape, grommets, snaps, buttons, or any combination of these. Wherever the backflow preventer is not in an enclosure, the securing mechanism must be capable of accepting a padlock.

20-2.03B(4) Backflow Preventer Enclosures
Each backflow preventer enclosure must:
1. Have expanded metal sides, ends, and top panels fabricated from 9-gauge minimum thickness stainless sheet steel with openings of approximately 3/4 by 1-3/4 inches
2. Have expanded metal panels attached to the 3/16-inch thick steel frame by a series of welds not less than 1/4 inch in length and spaced not more than 4 inches on center, along the edges of the enclosure
3. Have Type 304 stainless steel lock guards with a minimum thickness of 12 gauge.
4. Have hexagonal nuts and lock-type washers
5. Be powder coated by the manufacturer to match color no. 20450 of FED-STD-595.
6. Have padlock clasp or latch and lock mechanism

20-2.03C Construction
Finish exposed top surfaces of concrete pad with a medium broom finish applied parallel to the long dimension of pads.

Install hold-downs for the backflow preventer assembly enclosure when concrete is still plastic.

20-2.03D Payment
Not Used

20-2.04 CAM COUPLER ASSEMBLIES
20-2.04A General
Section 20-2.04 includes specifications for installing a cam coupler assembly.

20-2.04B Materials
Each cam coupler assembly must consist of a cam coupler, dust cap, check valve, pipes, fittings, concrete thrust block, and valve box with woven wire cloth and gravel.

Cam couplers and keys must be manufactured of brass or bronze and be able to withstand a working pressure of 150 psi.

Furnish 3 loose cam coupler keys before Contract acceptance.

20-2.04C Construction
Install cam coupler assemblies in valve boxes as shown.
20-2.05 CONTROL AND NEUTRAL CONDUCTORS

20-2.05A General

20-2.05A(1) Summary
Section 20-2.05 includes specifications for installing control and neutral conductors.

20-2.05A(2) Definitions
Reserved

20-2.05A(3) Submittals
Reserved

20-2.05A(4) Quality Control and Assurance
Perform field tests on control and neutral conductors. Field tests must comply with the specifications for lighting circuits in section 86-2.14B.

Where the conductors are installed by trenching and backfilling, perform field tests after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

20-2.05B Materials
Control and neutral conductors must comply with the requirements in section 86-2.08.

For connections between 24-volt irrigation controllers and valve solenoids, use control and neutral conductors. Conductors must include a control conductor for each valve and a common neutral.

Conductor insulation color, except for the stripes, must be continuous throughout. The color of the conductors must be consistent from the controller to each valve. Neutral conductors must be white. Do not use white for control conductors. Do not use conductors with green insulation except as permitted by the NEC.

Conductors must be:

1. No. 12 AWG or larger or no. 14 AWG or larger for armor-clad
2. Rated for 36 V or 600 V for armor-clad
3. Rated for direct burial
4. Underground feeder cable Type UF and TWU
5. Solid, uncoated copper for armor-clad
6. Not less than 90 percent of the AWG diameter required

No. 10 and smaller conductors must be insulated with a minimum of 56 mils of PVC or a minimum of 41 mils of polyethylene. No. 8 and larger conductors must be insulated with a minimum of 70 mils of PVC.

No. 10 and smaller armor-clad conductors must be insulated with a minimum of 41 mils of polyethylene. No. 8 and larger armor-clad conductors must be insulated with 54 to 60 mils of PVC.

Armor-clad conductors must include:

1. Stainless steel tape armor, Type 304 and helically wrapped with a 33 percent minimum overlap. The tape must be 0.5 inch wide and at least 0.005 inch thick.
2. PVC outer conductor jacket that is UV resistant and complies with the ICEA S-61-402, NEMA standard WC5 and UL listing 1263. The jacket nominal thickness must be 24 to 30 mils thick.

20-2.05C Construction

20-2.05C(1) General
Reserved

20-2.05C(2) In Open Trenches
Do not install control and neutral conductors above each other in an open trench. Wrap conductors together with electrical tape at 5 foot intervals.
Where conductors are installed in the same trench as supply line, install at the same depth as the line. At other locations, install conductors not less than 12 inches below finished grade.

Where conductors are not in a supply line trench, install conductors at least 4 feet from curbs, dikes, and paved shoulders.

**20-2.05C(3) In Conduits**
Install conductors in electrical conduit if conductors are to be:

1. Surface mounted
2. Installed in or on structures
3. Installed under paved areas
4. Installed in irrigation conduits
5. Placed in concrete

**20-2.05C(4) Splicing**
Splice low voltage control and neutral conductors under sections 86-2.09C, 86-2.09D, and 86-2.09E, except do not use method B. Tape used for splice insulation must be PVC tape.

Leave at least 2 feet of slack for each conductor at each:

1. Pull box
2. Valve box for each conductor that is connected to other facilities within the box or spliced within the box

Do not splice conductors in irrigation controller cabinets.

Permanent splice connections must be made with freshly cut and skinned conductors. Do not use temporary splices made for testing valve circuits as permanent splices.

**20-2.05C(5) Marking**
Mark control and neutral conductors in pull boxes, valve boxes, at irrigation control terminals, and at splices.

Mark conductor terminations and splices with adhesive cloth wrap-around markers. Seal markers with clear, heat-shrinkable sleeves.

Mark nonspliced conductors with clip-on C-shaped white extruded PVC sleeves. Sleeves must have black indented legends of uniform depth with transparent overlays over the legends and chevron cuts for the alignment of 2 or more sleeves.

Identify markers for the control conductors with the appropriate irrigation controller and station number.

**20-2.05D Payment**
Not Used

**20-2.06 FLOW SENSORS**

**20-2.06A General**
Section 20-2.06 includes specifications for installing a flow sensor.

**20-2.06B Materials**
Each flow sensor must be an inline type with a nonmagnetic spinning impeller as the only moving part.

The electronics housing must:

1. Be schedule 80 PVC or cast 85-5-5-5 bronze
2. Include glass-filled polyphenylene sulfide
3. Be easily removable from the meter body and include 2 ethylene-propylene O-rings

The impeller must be tungsten carbide.

The electronics must be rated to withstand prolonged water immersion conditions and include 2 single conductor 18 AWG leads, 48 inches long.
The insulation must be direct burial UF type colored red for the positive lead and black for the negative lead.

The flow sensor must be capable of withstanding:

1. 100 to 400 psi operating pressure depending on sensor size shown
2. Liquid temperatures up to 220 degrees F
3. Flows from 1/2 to 15 ft/sec

**20-2.06C Construction**
Install flow sensor as shown.

**20-2.06D Payment**
Not Used

**20-2.07 IRRIGATION CONTROLLERS**

**20-2.07A General**

**20-2.07A(1) Summary**
Section 20-2.07 includes specifications for installing irrigation controllers.

**20-2.07A(2) Definitions**

- **irrigation controller**: “Smart” irrigation controller as defined by the Irrigation Association.
- **remote irrigation control system (RICS)**: Centralized water management system that consists of a base station, centralized server, satellite controllers.
- **base station**: Designated computer located at a Department maintenance facility or District Office that collects data from a series of satellite controllers through a centralized server.
- **centralized server**: Designated server or web-based application that collects data from all base stations.
- **web-based application**: Encrypted managing software that is coded in a browser-supported language and is executable via a common internet web browser (e.g., Microsoft Internet Explorer, Firefox, Safari, etc.).
- **satellite controller**: Irrigation controller that communicates directly to a base station or centralized server.
- **network communication**: Identified means through which satellite controllers, base stations, and a centralized server communicate to one another (i.e., fiber optics, spread spectrum, phone line, etc.).
- **remote access device**: Device (i.e., FCC compliant radio remote, cell phone or wireless, etc.) used to communicate with satellite controllers from a remote location.

**20-2.07A(3) Submittals**
Submit as an informational submittal, a complete manufacturer's maintenance and operations manual for each type of controller installed. Submit the manual at the time the wiring plans and diagrams are placed inside the controller enclosure or cabinet door.

**20-2.07A(4) Quality Control and Assurance**
Provide training by a qualified person on the use and adjustment of the irrigation controllers installed 30 days before Contract acceptance.

Modifications to electrical components must be done by the manufacturer before shipment to the job site.

The installation date and expiration date of the manufacturer's guarantee for the controllers must be permanently marked on the inside face of the controller.

**20-2.07B Materials**

**20-2.07B(1) General**
Conventional A/C powered irrigation controllers must operate on 110/120 V, 60 Hz(ac) and supply 24 to 30 VAC, 60 Hz(ac) for operating electrical remote control valves.

Concrete for the pad and foundation must be minor concrete, except the concrete must not contain less than 463 pounds of cementitious material per cubic yard. Hand mixing of the concrete is allowed.
20-2.07B(2) Irrigation Controllers

20-2.07B(2)(a) General

The irrigation controllers must:

1. Be A/C, battery, solar, or 2-wire as shown.
2. Be from a single manufacturer.
3. Be fully automatic and capable of operating a complete 30-day or longer irrigation program.
4. Have a switch or button on the face of the irrigation control panel showing that the irrigation controller can be turned on or off and provide for automatic or manual operation. Manual operation must allow cycle start at the desired station and allow for the minimum activation of a single station or have the option to operate multiple stations in sequential or simultaneous operation modes.
5. Have non-volatile memory.
6. Have a watering time display on the face of the control panel.
7. Have a panel and circuit board connected to the low voltage control and neutral conductors by means of a plug and receptacle connectors located within the cabinet enclosure.
8. Have a variable or incremental timing adjustment ranging from 1 minute to 360 minutes per station.
9. Be capable of operating at least 3 program schedules.
10. Be capable of having at least 4 start times per program schedule.
11. Have an output that can energize a pump start circuit or a remote control master valve.
12. Be protected by fuses and circuit breakers.
13. Display a program and station affected by a sensory alert without altering other watering schedules not affected by the alert.
14. Be capable of global manual and automatic seasonal adjustments to all valves in any given program.
15. Automatically alter watering schedule in accordance with evapotranspiration data provided by a local weather station or have an internal programmed default of historical evapotranspirational data for a given region.
16. Support a flow sensor, rain sensor, or weather station and have automatic shut-off capability.
17. Be capable of communicating with the remote access device.

If the irrigation controller is installed in an enclosure cabinet, the cabinet must be stainless steel and must comply with section 86-3.04A.

Irrigation controllers not installed in enclosure cabinets must be weatherproof, constructed of fiberglass or metal and have a door lock with 2 keys provided.

RICS must meet the requirements of an irrigation controller and be capable of being accessible only through a secured and encrypted server that is password and firewall protected by the Department or be accessible through a firewall secure remote server that is independent from any Department servers. The Department will set up and manage the network communication.

20-2.07B(2)(b) Battery Powered Irrigation Controllers

Reserved

20-2.07B(2)(c) Solar Powered Irrigation Controllers

Reserved

20-2.07B(2)(d) Two-wire Irrigation Controllers

Reserved

20-2.07B(3) Irrigation Controller Enclosure Cabinets

The irrigation controller enclosure cabinet must:

1. Be stainless steel.
2. Include a mounting panel. Fabricate mounting panels with one of the following:
   2.1. 3/4-inch exterior AC grade veneer plywood. Paint panels with 1 application of an exterior, latex based, wood primer and 2 applications of an exterior, vinyl acrylic enamel, white in color. Paint panels on all sides and edges before installation of the panels in the cabinets and the equipment on the panels.
   2.2. 3/16-inch thick aluminum sheets.
   2.3. 10-gauge cold-rolled steel sheets.
   2.4. 0.157-inch stainless steel metal sheets.
3. Provide cross ventilation, roof ventilation, or a combination of both. Ventilation must not compromise the weather resistance properties of the cabinet and must be fabricated by the cabinet manufacturer.
4. Include protection against lightning damage.
5. Have an area inside the cabinet doors for storage of the as-built schematic wiring diagram and irrigation plans.
6. Have padlock clasp or latch and lock mechanism.

20-2.07B(4) Rain Sensors

A rain sensor unit must be a solid state, automatic shut-off type, and compatible with the irrigation controller. The rain sensor unit must automatically interrupt the master remote control valves when approximately 1/8 inch of rain has fallen. The irrigation controller must automatically be enabled again when the accumulated rainfall evaporates from the rain sensor unit collection cup.

Rain sensor units must be one of the following:
1. Rated 24 V(ac) to 30 V(ac)
2. Wireless and FCC compliant

20-2.07C Construction

Finish exposed top surface of concrete pad with a medium broom finish applied parallel to the long dimension.

Locate irrigation controllers in pedestal or wall mounted enclosures as shown.

Install electrical components for automatic irrigation systems under section 86-1.02.

Install irrigation controllers under the manufacturer’s instructions and as shown.

If 2 or more irrigation controllers operate the same remote master control valve, furnish and install an isolation relay under the controller manufacturer’s instructions.

Where direct burial conductors are to be connected to the terminal strip, connect the conductors with the open-end-crimp-on wire terminals. Exposed wire must not extend beyond the crimp of the terminal and the wires must be parallel on the terminal strip.

Install rain sensor units for irrigation controllers on the irrigation controller enclosure cabinets. Provide protection against lightning damage.

20-2.07D Payment

Payment for electrical service for 120-volt or higher is not included in the payment for irrigation controller.

20-2.08 IRRIGATION CONDUIT

20-2.08A General

20-2.08A(1) Summary

Section 20-2.08 includes specifications for installing irrigation conduit under a roadway or other facility to accommodate electrical conduit for control and neutral conductors and irrigation supply lines.

Before performing work on irrigation systems, locate existing conduits shown to be incorporated into the new work.

Before removing or disturbing existing Type A pavement markers that show the location of the existing conduit, mark the location of the existing conduit on the pavement.

20-2.08A(2) Definitions

Reserved

20-2.08A(3) Submittals

Reserved

20-2.08A(4) Quality Control and Assurance

Demonstrate the conduits are free of obstructions after placement of base and surfacing.
Before and after extending the irrigation supply line in a conduit, pressure test the supply line under section 20-2.01A(4)(b).

After conductors are installed in a conduit, test the conductors under section 20-2.05A(4).

Assign a technical representative to direct and control the directional bore activities. The representative must be present during directional bore activities. Unless otherwise authorized, perform directional bore activities in the presence of the Engineer.

20-2.08B Materials

20-2.08B(1) General
Reserved

20-2.08B(2) ABS Composite Pipe Conduit
ABS composite pipe and couplings must comply with ASTM D 2680. Couplings must be solvent cement type.

20-2.08B(3) Corrugated High Density Polyethylene Pipe Conduit
Corrugated high density polyethylene pipe must comply with ASTM F 405 and F 667 or be Type S and comply with AASHTO M252 and M294. Couplings and fittings must be as recommended by the pipe manufacturer.

20-2.08B(4) Corrugated Steel Pipe Conduit
Corrugated steel pipe conduit must comply with section 66. The nominal thickness of metal sheets for pipe must be 0.064 inch for corrugated steel pipe and 0.060 inch for corrugated aluminum pipe. Coupling bands and hardware must comply with section 66.

20-2.08B(5) Polyvinyl Chloride Pipe Conduit
PVC pipe conduit must be schedule 40 and comply with ASTM D 1785.
Fittings must be schedule 80.

20-2.08B(6) Welded Steel Pipe Conduit
Welded steel pipe must comply with ASTM A 53. Pipe must be black and have either welded or threaded joints.

The minimum wall thickness for the various sizes of welded steel pipe must comply with the dimensions shown in the following table:

<table>
<thead>
<tr>
<th>Pipe size, nominal (inch)</th>
<th>Minimum wall thickness (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.216</td>
</tr>
<tr>
<td>4</td>
<td>0.237</td>
</tr>
<tr>
<td>6</td>
<td>0.280</td>
</tr>
<tr>
<td>8</td>
<td>0.277</td>
</tr>
<tr>
<td>10</td>
<td>0.279</td>
</tr>
<tr>
<td>12</td>
<td>0.330</td>
</tr>
</tbody>
</table>

20-2.08C Construction

20-2.08C(1) General
When existing conduits are to be incorporated in new work, excavate exploratory holes for locating existing conduits at the locations indicated by existing markers or as directed. Excavate and backfill exploratory holes to a maximum size of 2-1/2 feet in width, 5 feet in depth, and 5 feet on each side of the marker or directed location parallel to the roadway. If the conduit is not found and if ordered, increase the size of the exploratory holes beyond the dimensions specified. The additional excavation and backfill is change order work.

If extending an existing conduit, remove conductors from the conduit.

Use a coupling band if the new conduit matches the existing conduit diameter, otherwise overlap the conduit at least 12 inches.

After extending existing conduits, install conductors that match the color and size of the existing conductors without splices. Splice conductors in adjacent pull boxes.
If installing a control and neutral conductor and electrical conduit through the irrigation conduit, install a no. 5 pull box at each end.

Remove debris found in the conduit before performing other work. Debris found more than 3 feet from the ends of the conduits is removed as change order work.

Extend conduit 2 feet beyond all paving unless otherwise shown.

Cap the ends of unused conduit.

Designate the location of each conduit by cementing a Type A pavement marker as shown. Type A pavement markers and adhesive must comply with section 85.

20-2.08C(2) Welded Steel Pipe Conduit

20-2.08C(2)(a) General

Install welded steel pipe by directional boring or jack and drill.

Install top of conduits:
1. 18 to 30 inches below the finished surface in sidewalk areas
2. 40 to 52 inches below the finished grade in other paved areas

20-2.08C(2)(b) Directional Boring

Notify the Engineer 2 business days before starting directional bore activities.

The diameter of the boring tool for directional boring must be only as large as necessary to install the conduit.

Mineral slurry or wetting solution may be used to lubricate the boring tool and to stabilize the soil surrounding the boring path. The mineral slurry or wetting solution must be water based.

The directional bore equipment must have directional control of the boring tool and have an electronic boring tool location detection system. During operation, the directional bore equipment must be able to determine the location of the tool both horizontally and vertically.

20-2.08C(2)(c) Jack and Drill

Notify the Engineer 2 business days before starting jack and drill activities.

Jacking or drilling pits must be no closer than 2 feet from pavement edge whenever possible.

If authorized, small holes may be cut in the pavement to locate or remove obstructions.

Do not use excessive water that will soften subgrade or undermine pavement.

20-2.08C(3) Schedule 40 Pipe Conduit

Where schedule 40 pipe conduit 2 inches or less in outside diameter is installed under surfacing, you may install by directional boring under section 20-2.08C(2)(b).

For conduit 2 inches or less in diameter, the top of the conduit must be a minimum of 18 inches below surfacing.

Extend schedule 40 pipe conduit 6 inches beyond surfacing. Cap ends of conduit until used.

20-2.08D Payment

Schedule 40 PVC pipe conduit is paid for as plastic pipe (schedule 40) (supply line).

20-2.09 Irrigation Supply Line

20-2.09A General

20-2.09A(1) Summary

Section 20-2.09 includes specifications for installing irrigation supply line.

If the supply line location interferes with the excavation of plant holes, relocate the plant hole to clear the supply line. Do not install supply lines through plant holes unless shown.
Supply lines, control and neutral conductors and electrical conduits installed in common trenches must not be installed above each other.

20-2.09A(2) Definitions
Reserved

20-2.09A(3) Submittals
Submit a certificate of compliance for polyethylene pipe and plastic pipe supply line.

20-2.09A(4) Quality Control and Assurance
Solvent cement must comply with the local Air Quality Management District requirements.

20-2.09B Materials
20-2.09B(1) General
Irrigation supply pipe must be metal or plastic as shown.

PCC for thrust blocks must be produced from commercial-quality aggregates. The concrete must contain at least 295 pounds of cementitious material per cubic yard.

20-2.09B(2) Copper Pipe Supply Line
Copper pipe must be Type K rigid pipe and comply with ASTM B 88. Fittings must be wrought copper or cast bronze either soldered or threaded.

Solder must be 95 percent tin and 5 percent antimony.

20-2.09B(3) Galvanized Steel Pipe Supply Line
Galvanized steel pipe supply line and couplings must be standard weight and comply with ASTM A 53, except that the zinc coating must not be less than 90 percent of the specified amount. Except for couplings, fittings must be galvanized malleable iron, banded and threaded, and comply with ANSI B16.3, Class 150.

Joint compound must be nonhardening and noncorrosive. Do not use pipe thread sealant tape.

20-2.09B(4) Drip Irrigation Tubing
Drip irrigation tubing must be virgin polyethylene plastic and comply with ASTM D 2737.

The drip irrigation tubing must be distribution tubing with preinstalled in-line emitters.

If preinstalled in-line drip irrigation tubing is not shown, you may install emitters that match the distribution requirements shown. The emitters must be barbed or threaded-type outlet devices with dual silicone diaphragms and installed under the manufacturer's instructions.

The emitters must meet the flow rate and operating pressure range shown.

The wall thickness of polyethylene tubing must comply with the following requirements when tested under ASTM D 2122:

<table>
<thead>
<tr>
<th>Pipe size, nominal (inch)</th>
<th>Minimum wall thickness (inch)</th>
<th>Maximum wall thickness (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>0.050</td>
<td>0.070</td>
</tr>
<tr>
<td>5/8</td>
<td>0.055</td>
<td>0.075</td>
</tr>
<tr>
<td>3/4</td>
<td>0.060</td>
<td>0.080</td>
</tr>
</tbody>
</table>

The polyethylene tubing fittings must be leak-free, compression type and have female sockets with an internal barb to provide a positive pipe-to-fitting connection that will not separate at the designed pressure.

20-2.09B(5) Plastic Pipe Supply Line
Plastic pipe supply line must be PVC pipe that is NSF approved.

Schedule 40 plastic pipe supply line must comply with ASTM D 1785.
Class 315 plastic pipe supply line must comply with ASTM D 2241.

PVC gasketed bell joints must comply with ASTM D 2672, ASTM D2241, ASTM D 3139, and ASTM F 477.

For solvent-cemented type joints, the primer and solvent cement must be made by the same manufacturer. The primer color must contrast with the color of the pipe and fittings.

Solvent-cemented fittings must be injection molded PVC, schedule 40, and comply with ASTM D 2466.

Fittings for supply line placed in irrigation conduit must be schedule 80.

Fittings for plastic pipe supply line larger than 4 inches must be ductile iron under section 20-2.14C(2)(b).

If UV-resistant plastic pipe supply line is required, the pipe must be homogeneous, uniform color and be manufactured of:

1. At least 80 percent vinyl chloride resin with UV stabilizers
2. Non-PVC resin modifiers and coloring ingredients
3. Coloring ingredients with UV stabilizers

20-2.09C Construction
20-2.09C(1) General
Cut pipe straight and true. After cutting, ream out the ends to the full inside diameter of the pipe.

Prevent foreign material from entering the irrigation system during installation. Immediately before assembling, clean all pipes, valves, and fittings. Flush lines before attaching sprinklers, emitters, and other terminal fittings. Reuse water from waterline flushing for landscape irrigation if practicable.

Pipe supply lines installed between the water meter and backflow preventer assembly must be installed not less than 18 inches below finished grade measured to the top of the pipe.

Where a connection is made to existing supply lines, bell and gasketed fittings or compression fittings may be used.

Install a thrust block at each change in direction on the main supply line, terminus run, and at other locations shown.

Where supply lines cross paved ditches more than 3 feet deep at their flow line, install galvanized steel pipe for the entire span of the ditch.

Secure UV resistant plastic pipe supply line on grade as shown.

20-2.09C(2) Galvanized Steel Pipe Supply Line
Coat male pipe threads on galvanized steel pipe according to the manufacturer's instructions.

20-2.09C(3) Drip Irrigation Tubing
Install drip irrigation tubing on grade and under manufacturer's instructions.

Install a flush valve and an air-relief valve if recommended by the drip valve assembly manufacturer.

20-2.09C(4) Plastic Pipe Supply Line
For PVC pipe 1-1/2 inches in diameter or smaller, cut the pipe with PVC cutters.

For solvent-cemented type joints, apply primer and solvent-cement separately under the manufacturer's instructions.

Wrap the male portion of each threaded plastic pipe fitting with at least 2 layers of pipe thread sealant tape.

Install plastic pipe supply line mains with solvent-cemented type joints not less than 18 inches below finished grade measured to the top of the pipe.
Install plastic pipe supply line laterals with solvent-cemented type joints not less than 12 inches below finished grade measured to the top of the pipe.

Snake plastic pipe installed by trenching and backfilling methods.

20-2.09D Payment
Supply line pipe and drip irrigation tubing are measured along the slope.

20-2.10 SPRINKLER ASSEMBLIES
20-2.10A General
Section 20-2.10 includes specifications for installing sprinkler assemblies.

20-2.10B Materials
20-2.10B(1) General
Each sprinkler assembly must meet the characteristics shown in the irrigation legend.

Where shown, a sprinkler assembly must have a flow shut-off device that automatically stops the flow of water on the downstream side of the device when the assembly is broken. You may use a sprinkler assembly with a preinstalled flow shut-off device or you must install a flow shut-off device under the manufacturer’s instructions.

Flexible hose for sprinkler assembly must be leak-free, nonrigid and comply with ASTM D 2287, cell Type 6564500. The hose wall thickness must comply with ASTM D 2122 for the hose diameters shown in the following table:

<table>
<thead>
<tr>
<th>Hose diameter, nominal (inch)</th>
<th>Minimum wall thickness (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>0.127</td>
</tr>
<tr>
<td>3/4</td>
<td>0.154</td>
</tr>
<tr>
<td>1</td>
<td>0.179</td>
</tr>
</tbody>
</table>

Solvent cement and fittings for flexible hose must comply with section 20-2.09B(5).

20-2.10B(2) Pop-Up Sprinkler Assemblies
Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure compensation device, check valve, sprinkler protector, and fittings as shown.

20-2.10B(3) Riser Sprinkler Assemblies

Each riser sprinkler assembly must include a riser or flexible hose, threaded nipple, swing joint, check valve, and nozzle as shown. The riser must be UV resistant schedule 80, PVC 1120 or PVC 1220 pipe and comply with ASTM D 1785.

20-2.10B(4) Tree Well Sprinkler Assemblies
Each tree well sprinkler assembly must include a body, riser, swing joint, perforated drainpipe, and drain cap.

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.

Drain cap must be commercially available, 1 piece, injection molded drain 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. Gravel must be clean, washed, dry, and free from clay or organic material.

20-2.10C Construction
Install pop-up and riser sprinkler assembly:
1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 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.

Install tree well sprinkler assembly as shown.

20-2.10D Payment
Not Used

20-2.11 VALVES
20-2.11A General
Section 20-2.11 includes specifications for installing valves.

20-2.11B Materials
20-2.11B(1) General
Valves must:

1. Include a valve box and cover
2. Be the same size as the supply line that the valve serves unless otherwise shown
3. Be bottom, angled, or straight inlet configuration

20-2.11B(2) Ball Valves
Ball valve must be a two-piece brass or bronze body and comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonshock working pressure, min</td>
<td>400 psi</td>
</tr>
<tr>
<td>Seats</td>
<td>PTFE</td>
</tr>
<tr>
<td>O-ring seals</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

Ball valve must be the same size as the supply line that the valve serves.

20-2.11B(3) Check Valves
Each check valve must:

1. Be schedule 80 PVC and factory set to 5 psi for adjustable spring check valve
2. Be Class 200 PVC for swing check valves on non pressurized plastic irrigation supply line

20-2.11B(4) Drip Valve Assemblies
Each drip valve assembly must include:

1. Remote control valve
2. Wye filter with:
   2.1. Filter housing that:
      2.1.1. Can withstand a working pressure of 150 psi
      2.1.2. Is manufactured of reinforced polypropylene plastic
   2.2. Reusable stainless steel filter cartridge with a 200 mesh size filtration
3. Ball valve under 20-2.11B(2)
4. Schedule 80 PVC pipes and fittings
5. Pressure regulator

20-2.11B(5) Garden Valve Assemblies
Each garden valve assembly must have:

1. Garden valve
2. Location marker
20-2.11B(6) Gate Valves

Gate valves must be:

1. Flanged or threaded type
2. Iron or bronze body
3. Bronze trimmed with one of the following:
   3.1. Internally threading rising stem
   3.2. Nonrising stem
4. Able to withstand a working pressure of 150 psi
5. Same size as the pipeline that the valves serves unless otherwise shown

Gate valves smaller than 3 inches must have a cross handle.

Gate valves 3 inches or larger must be flanged type with a square nut. Furnish 3 long shank keys before Contract acceptance.

Gate valves attached to the outlets of a wye strainer must have seating rings on the discharge side of the gate valves must be PTFE. Valve wedges must be driven obliquely by cam action into the seating rings.

20-2.11B(7) Pressure Regulating Valves

Pressure regulating valve must be:

1. Flanged or threaded type
2. Brass, bronze, cast iron, or plastic body
3. Spring diaphragm type
4. Pilot controlled

Pressure regulating valve must have no internal filter screens.

20-2.11B(8) Pressure Relief Valves

Pressure relief valve must have a brass or bronze body, stainless steel springs, bronze nickel chrome seats, composition seat discs, female bottom inlets, and female side outlets.

20-2.11B(9) Quick Coupling Valves

Quick coupling valve must be 3/4 inch double slotted with a self-closing cap, 3/4-inch brass key and 3/4-inch brass hose swivel unless otherwise shown. Except for the cap, quick coupling valve must be brass or bronze construction. Furnish 3 loose quick coupling brass keys and brass hose swivels before Contract acceptance.

20-2.11B(10) Remote Control Valves

20-2.11B(10)(a) General

Each remote control valve must:

1. Be normally closed type.
2. Be glass filled nylon, brass, or bronze.
3. Be completely serviceable from the top without removing the valve body from the system.
4. Be equipped with a device that regulates and adjusts the flow of water and be provided with a manual shut-off. The manual shut-off for valves larger than 3/4 inch must be operated by a cross handle.
5. Have solenoids compatible with the irrigation controller.
6. Have a manual bleed device.
7. Be capable of withstanding a pressure of 200 psi
8. Have replaceable compression discs or diaphragms.
9. Have threaded fittings for inlets and outlets.
10. Have DC latching solenoids when used with solar or battery controllers. Solenoids must operate on 3.5 V.

20-2.11B(10)(b) Remote Control Valves with Flow Sensor

Reserved

20-2.11B(10)(c) Remote Control Valves with Pressure Regulator

Each remote control valve with pressure regulator must be factory assembled as 1 unit.
20-2.11B(11) Wye Strainer Assemblies
Each wye strainer assembly must include:

1. Wye strainer
2. Garden valve

20-2.11C Construction
20-2.11C(1) General
Install control valves:

1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 3 feet from fences, walls, or both

If a control valve cannot be installed within these limits, the location will be determined by the Engineer.

20-2.11C(2) Check Valves
Unless otherwise shown, install spring-action check valves as necessary to prevent low head drainage.

20-2.11C(3) Garden Valve Assemblies
Install a location marker 8 to 10 inches from the back of each garden valve.

20-2.11C(4) Pressure Regulating Valves
Install pressure regulating valves with threaded connections and a union on the inlet side of the valves.

20-2.11C(5) Wye Strainer Assemblies
Unless shown, install wye strainer assembly on the upstream side of the remote control valves.
Install garden valve so that when the system is flushed, the discharge sprays out of the valve box.

20-2.11D Payment
Not Used

20-2.12–20-2.13 RESERVED

20-2.14 SUPPLY LINE ON STRUCTURES
20-2.14A General
20-2.14A(1) General
20-2.14A(1)(a) Summary
Section 20-14 includes specifications for installing water supply lines through bridges and on the exterior of concrete structures.

20-2.14A(1)(b) Definitions
Reserved

20-2.14A(1)(c) Submittals
Submit a work plan for temporary casing support at the abutments as an informational submittal.

20-2.14A(1)(d) Quality Control and Assurance
20-2.14A(1)(d)(i) General
Before installing seismic expansion assemblies or expansion assemblies, the Engineer must authorize the extension setting.

20-2.14A(1)(d)(ii) Regulatory Requirements
Piping materials must bear the label, stamp, or other markings of the specified standards.
20-2.14A(1)(d)(iii) Site Tests

Test water supply lines before:

1. Backfilling
2. Beginning work on box girder cell decks
3. Otherwise covering the water supply lines

Furnish pipe anchorages to resist thrust forces occurring during testing.

Test the water supply lines as 1 unit. The limits of the unit must be 5 feet beyond the casing at each end of the bridge.

Cap each end of the water supply lines before testing. Caps must be rated for the test pressure.

Test water supply lines under section 20-2.01A(4)(b), except that the testing period must be 4 hours with no pressure drop.

For water supply lines 4 inches and larger testing must meet the following additional requirements:

1. Testing pressure must be at least 120 psi
2. Air relief valve must not be subjected to water pressure due to testing

If water supply lines fail testing, retest the lines after repair.

20-2.14A(2) Materials

20-2.14A(2)(a) General

Protect stored piping from moisture and dirt. Elevate piping above grade. Support piping to prevent sagging and bending.

Protect flanges, fittings, and assemblies from moisture and dirt.

20-2.14A(2)(b) Air Release Valve Assemblies

Air release valve assemblies include an air release valve, ball valve, tank vent, nipples, and pipe saddle. Assemblies must comply with the following:

1. Air release valves must have a cast iron body with stainless steel trim and float, 1-inch NPT inlet, 1/2-inch NPT outlet, and 3/16-inch orifice.
2. Ball valves must have a 2-piece bronze body with chrome plated or brass ball, 1-inch full-size port, and be rated for at least 400 psi.
3. Tank vents must have a 1/2-inch NPT inlet and downward-facing double openings with screened covers.
4. Nipples must be schedule 40 galvanized steel pipe.
5. Pipe saddle must be rated for at least 150 psi and compatible with water supply line. Pipe saddle must be (1) single strap pipe saddle for water supply lines smaller than 4 inches or (2) double strap pipe saddle for water supply lines 4 inches and larger. You may use a tee fitting for galvanized steel water supply lines.

20-2.14A(2)(c) Casings

Casings must be welded steel pipe casing complying with section 70-7.

20-2.14A(2)(d) Pipe Wrap Tape

Pipe wrap tape must be pressure sensitive tape made from PVC or polyethylene. Pipe wrap tape must be at least 50 mils thick and not wider than 2 inches.

20-2.14A(2)(e) Pipe Hangers

Pipe hangers must comply with section 70-7.02C.

The pipe hanger must be rated for the water supply line. If casings are shown, include the casings weight.

20-2.14A(2)(f) Epoxy Adhesives

Epoxy used for anchoring concrete pipe supports must comply with section 70-7.02D.
20-2.14A(2)(g) Concrete Pipe Supports
Concrete pipe supports must comply with section 70-7.02D.

20-2.14A(2)(h) Pipe Clamps and Anchors
Metal clamps must be commercial quality steel complying with section 75-1.02. Anchors must comply with the specifications for concrete anchorage devices in section 75-1.03C.

20-2.14A(2)(i) Pull Boxes
Pull boxes and covers must comply with section 20-2.01B(5).

20-2.14A(3) Construction
20-2.14A(3)(a) General
Support water supply lines as described.

Where water supply lines penetrate bridge superstructure concrete, either form or install pipe sleeves at least 2 pipe sizes larger than the pipe.

20-2.14A(3)(b) Preparation
Clean the interior of the pipe before installation. Cap or plug openings as pipe is installed to prevent the entrance of foreign material. Leave caps or plugs in place until the next pipe section is installed.

20-2.14A(3)(c) Installation
20-2.14A(3)(c)(i) General
Reserved

20-2.14A(3)(c)(ii) Casings
Install casings under section 70-7.03.
Seal casing end with 8 inches of polyurethane foam at dirt stop or pipe end seal.

Wrap damaged supply line coatings with pipe wrap tape. Wrap field joints and fittings that are in contact with the earth.

Wrapping must comply with the following:
1. Clean and prime area as recommended by the tape manufacturer.
2. Tightly wrap tape with 1/2 uniform overlap, free from wrinkles and voids, to provide not less than a 100 mil thickness.
3. The tape must conform to joint or fitting contours.
4. Extend tape at least 6 inches over adjacent pipe.

20-2.14A(3)(c)(iv) Pipe Clamps and Anchors
Install water supply lines on the exterior surfaces of bridges or other concrete structures with metal clamps and anchors.

Drilling of holes for anchors must comply with the following:
1. Drill holes to manufacturers recommended depth.
2. Drilling tools must be authorized.
3. Do not drill holes closer than 6 inches to the edge of a concrete structure.
4. Relocate holes if reinforcing steel is encountered. Fill abandoned holes with mortar. Mortar must comply with section 51-1.02F.

Where water supply lines are mounted vertically for more than 2 feet, install clamps and anchors within 6 inches of the elbows.

Where water supply lines are mounted vertically for more than 10 feet, install additional clamps and anchors at 10 foot centers unless otherwise shown.
20-2.14A(3)(d) Sequences of Operation
If the bridge superstructure is to be prestressed do not place mortar around casings in abutments and hinges until bridge superstructure prestressing has been completed.

20-2.14A(4) Payment
Supply line on structures is measured from end to end, along the centerline.

The Department does not pay for failed tests.

20-2.14B Supply Line on Structures, Less than 4 Inches
20-2.14B(1) General
20-2.14B(1)(a) Summary
Section 20-2.14B includes specifications for installing water supply lines smaller than 4 inches.

20-2.14B(1)(b) Definitions
Reserved

20-2.14B(1)(c) Submittals
Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:
1. Water supply line
2. Expansion assemblies
3. Casing insulators
4. Pipe end seals
5. Pipe anchorages
6. Air release valve assemblies
7. Casings
8. Pipe hangers
9. Epoxy adhesives
10. Concrete pipe supports

20-2.14B(1)(d) Quality Control and Assurance
Reserved

20-2.14B(2) Materials
20-2.14B(2)(a) General
Reserved

20-2.14B(2)(b) Water Supply Line
Water supply lines must comply with section 20-2.09.

20-2.14B(2)(c) Expansion Assemblies
Expansion assemblies must consist of a hose with ends, insulated flange connections, and elbows. Expansion assemblies must have the same nominal inside diameter as the water supply line. Working pressure must be at least 150 psi.

Hose must be medium or heavy weight, crush and kink resistant, rated for at least 150 psi. Cover must be flexible, oil resistant rubber or synthetic, reinforced with at least 2-ply synthetic yarn or steel wire. The inner tube must meet FDA and USDA Standards for potable water. Hose ends must be stainless steel flanged connections with stainless steel crimped bands or swaged end connectors. Do not use barbed ends with band clamps.

Elbows must be 45 degree, standard weight galvanized steel fittings.

20-2.14B(2)(d) Casing Insulators
Casing insulators must be:
1. 2-piece, high-density, injection-molded polyethylene, nonconductive inner liner, with cadmium-plated nuts and bolts.
2. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any contact between pipe and casing and have at least 2 runners seated on the bottom of the casing.
3. Sized for the casing and water supply line shown.

20-2.14B(2)(e) Pipe Anchorages
Pipe anchorages must consist of an I-beam, U-bolts, anchors, and double nuts.

Use concrete anchorage devices for anchors on existing bridges. Use L-anchor bolts for anchors on new bridges.

Fabricate the I-beam from 1/2-inch steel plate. Steel plate, U-bolts, L-anchors, and nuts must comply with section 75-1.02. Concrete anchorage devices must comply with section 75-1.03C.

20-2.14B(2)(f) Pipe End Seals
Pipe end seals must consist of a pipe end seal, stainless steel bands, and polyurethane foam.

Pipe end seal must be factory constructed from seamless neoprene and sized for the casing and water supply line shown. Neoprene must be at least 1/8 inch thick. Stainless steel bands must be crimped.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

20-2.14B(3) Construction
Locate pipe anchorage halfway between expansion assemblies.

Pipe end seal must be pulled onto the casing during pipe installation. Do not use wrap-around type end seals.

20-2.14B(4) Payment
Supply line on structures is paid for as galvanized steel pipe (supply line on bridge).

20-2.14C Supply Line on Structures, 4 Inches and Larger

20-2.14C(1) General

20-2.14C(1)(a) Summary
Section 20-2.14C includes specifications for installing water supply lines 4 inches and larger.

20-2.14C(1)(b) Definitions
Reserved

20-2.14C(1)(c) Submittals
Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:
1. Water supply line
2. Expansion assemblies
3. Flange insulating gaskets
4. Casing insulators
5. Seismic expansion assemblies
6. Lateral restraint assemblies
7. Air release valve assemblies
8. Casings
9. Pipe hangers
10. Epoxy adhesives
11. Concrete pipe supports

Submit the maximum range and preset dimension for each expansion assembly or seismic expansion assembly as an informational submittal.

Submit at least 5 sets of product data to OSD, Documents Unit. Each set must be bound together and include an index stating equipment names, manufacturers, and model numbers. Two sets will be returned. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.
20-2.14C(1)(d) Quality Control and Assurance
Reserved

20-2.14C(2) Materials
20-2.14C(2)(a) General
Reserved

20-2.14C(2)(b) Water Supply Line

Ductile iron pipe connections to expansion assemblies must be a flanged joint complying with ANSI/AWWA C115/A21.15. Flange gaskets must be rated for a working pressure of 350 psi. Fasteners must comply with section 75-1.02, except that stainless steel fasteners must not be used.

All other ductile iron pipe and fitting joints must be push-on, restrained type complying with ANSI/AWWA C111/A21.11. Push-on, restrained type joints may use proprietary dimensions and proprietary restrained joint locking systems.

Ductile iron pipe and fittings must have an asphaltic coating complying with ANSI/AWWA C151/A21.51, and a cement mortar lining complying with ANSI/AWWA C104/A21.4.

20-2.14C(2)(c) Expansion Assemblies
Expansion assemblies must be a sleeve type expansion joint. The expansion assembly must have:

1. Ductile iron body complying with ANSI/AWWA C153/A21.53
2. Flanged ends complying with ANSI/AWWA C110/A21.10
3. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
4. Internal expansion sleeve limiting stop collars and be pressure balanced
5. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches
6. NSF 61 certification

The expansion assembly must be factory set at 1/2 the extension capacity.

20-2.14C(2)(d) Flange Insulating Gaskets
Flange insulating gaskets must consist of a dielectric flange gasket, insulating washers and sleeves, and commercial quality steel bolts and nuts. Dielectric flange gasket must have a dielectric strength of at least 500 vpm.

20-2.14C(2)(e) Casing Insulators
Casing insulators must be:

1. 2-piece, 8-inch, 14-gauge epoxy-coated or galvanized steel band, four 2-inch-wide glass-reinforced polyester or polyethylene runners, with cadmium-plated nuts and bolts.
2. Coated with at least 15-mils heat-fused PVC to provide a nonconductive inner liner.
3. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any pipe to casing contact and have at least 2 runners seated on the bottom of the casing.
4. Sized for the casing and water supply line shown.

20-2.14C(2)(f) Dirt Stops
Dirt stops must consist of a redwood cover with polyurethane foam.

Use construction heart grade redwood complying with 57-2.01B(2). Construct cover to fit snugly around the water supply line. The cover must be 2 inches taller and 2 inches wider than the casing.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

20-2.14C(2)(g) Seismic Expansion Assemblies
Seismic expansion assemblies must be a sleeve type expansion joint with integral ball joints at each end.
Seismic expansion assemblies must have:

1. Ability to withstand at least 15 degree angular deflection at each end and maximum movement in all 3 planes at the same time
2. Ductile iron body complying with ANSI/AWWA C153/A21.53
3. Flanged ends complying with ANSI/AWWA C110/A21.10
4. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
5. Internal expansion sleeve limiting stop collars and pressure balanced
6. Ball joints contained in flanged retainers with seal gaskets
7. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches
8. NSF 61 certification

The seismic expansion assembly must be factory set at 1/2 the extension capacity.

**20-2.14C(2)(h) Lateral Restraint Assemblies**

Lateral restraint assemblies must be (1) constructed from commercial quality steel components complying with section 75-1.02, (2) adjustable, and (3) able to resist a horizontal force of 10 percent of the contributory dead load.

**20-2.14C(3) Construction**

Each ductile iron pipe must be connected and fully extended (pulled out) after joint assembly before the next pipe section is added.

Install flange insulating gaskets on the outside flange of seismic expansion assemblies and expansion assemblies.

**20-2.14C(4) Payment**

Supply line on structures is paid for as supply line (bridge).

**20-2.15 TEMPORARY IRRIGATION SYSTEMS**

Reserved

**20-2.16–20-2.19 RESERVED**

**20-3 PLANTING**

**20-3.01 GENERAL**

**20-3.01A General**

**20-3.01A(1) Summary**

Section 20-3 includes specifications for performing planting work in new and existing landscapes.

**20-3.01A(2) Definitions**

Reserved

**20-3.01A(3) Submittals**

**20-3.01A(3)(a) General**

Submit nursery invoices showing species or variety and inspection certificates for plants.

Submit documentation of clearance from the county agricultural commissioner for plants obtained from a county outside the project limits.

If a root stimulant is required, submit a copy of the root stimulant manufacturer's product sheet and instructions for the application of the root stimulant.

If cuttings are to be taken from outside the right-of-way, submit proof of permits and payment of associated fees. Notify the Engineer of the location at least 15 days before taking cuttings.

**20-3.01A(3)(b) Vendor Statements**

At least 60 days before planting the plants, submit a statement from the vendor that the order for the plants required, including sample plants used for inspection, has been received and accepted by the vendor. The statement from the vendor must include the plant names, sizes, and quantities and the anticipated delivery date.
20-3.01A(3)(c) Certificates of Compliance
Submit a certificate of compliance for:
1. Sod
2. Soil amendment

20-3.01A(4) Quality Control and Assurance
Plants must comply with federal and state laws requiring inspection for diseases and infestations. Inspection certificates required by law must accompany each shipment of plants.

Obtain clearance from the county agricultural commissioner before planting plants delivered from a county outside the project limits.

The Engineer inspects the roots of container-grown sample plants by removing earth from the rootball of not less than 2 plants, nor more than 2 percent of the total number of plants of each species or variety. If container-grown plants are purchased from several sources, the Engineer inspects the roots of not less than 2 of each sample plant species or variety from each source. The rootball of container grown plants must not show evidence of being underdeveloped, deformed, or having been restricted.

If the Engineer finds noncompliant plants, the entire lot represented by the noncompliant sample plants will be rejected.

Cuttings with mature or brown stems and cuttings that have been trimmed will be rejected.

20-3.01B Materials
20-3.01B(1) General
Notify the Engineer at least 10 days before the plants are shipped to the job site.

20-3.01B(2) Plants
20-3.01B(2)(a) General
Plants must be the variety and size shown and true to the type or name shown. Plants must be individually tagged or tagged in groups identifying the plants by species or variety. Tagging is not required for cuttings.

Plants must be healthy, well-formed, not root-bound, free from insect pests and disease, and grown in nurseries inspected by the Department of Food and Agriculture.

The plants must comply with the size and type shown in the following table:

<table>
<thead>
<tr>
<th>Plant group designation</th>
<th>Description</th>
<th>Container size (cu in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No. 1 container</td>
<td>152–251</td>
</tr>
<tr>
<td>B</td>
<td>No. 5 container</td>
<td>785–1242</td>
</tr>
<tr>
<td>C</td>
<td>Balled and burlapped</td>
<td>--</td>
</tr>
<tr>
<td>E</td>
<td>Bulb</td>
<td>--</td>
</tr>
<tr>
<td>F</td>
<td>In flats</td>
<td>--</td>
</tr>
<tr>
<td>H</td>
<td>Cutting</td>
<td>--</td>
</tr>
<tr>
<td>I</td>
<td>Pot</td>
<td>--</td>
</tr>
<tr>
<td>K</td>
<td>24-inch box</td>
<td>5775–6861</td>
</tr>
<tr>
<td>M</td>
<td>Liner*</td>
<td>--</td>
</tr>
<tr>
<td>O</td>
<td>Acorn</td>
<td>--</td>
</tr>
<tr>
<td>P</td>
<td>Plugs*</td>
<td>--</td>
</tr>
<tr>
<td>S</td>
<td>Seedling*</td>
<td>--</td>
</tr>
<tr>
<td>U</td>
<td>No. 15 container</td>
<td>2768–3696</td>
</tr>
</tbody>
</table>

*a Do not use containers made of biodegradable material.
*b Grown in individual container cells.
*c Bare root.

Trucks used for transporting plants must be equipped with covers to protect plants from windburn.
Handle and pack plants in an authorized way for the species or variety.

20-3.01B(2)(b) Cuttings
20-3.01B(2)(b)(i) General
   Take cuttings at random from healthy, vigorous plants. Make cuts with sharp, clean tools. Do not take more than 25 percent of an individual plant and not more than 50 percent of the plants in an area.

   Keep cuttings covered and wet until planted. Do not allow cuttings to dry or wither.

   Plant cuttings no more than 2 days after being cut.

20-3.01B(2)(b)(ii) Carpodotus and Delosperma Cuttings
   You may take cuttings for new Carpodotus and Delosperma groundcover from the existing highway planting areas, but these areas may not provide enough material to complete the work. Contact the local District's encroachment permit office to obtain a permit to harvest cuttings, identify acceptable cutting harvest areas, and to determine acceptable quantities to take.

   Take tip cuttings from healthy, vigorous Carpodotus and Delosperma plants that are free of pests and disease.

   Carpodotus cuttings must be 10 inches or more in length and not have roots.

   Delosperma cuttings must be 6 inches or more in length and not have roots.

20-3.01B(2)(b)(iii) Willow Cuttings
   Take willow cuttings from areas shown or designated by the Engineer.

   Willow cuttings must be:
   1. Reasonably straight
   2. 20 to 24 inches in length
   3. 3/4 to 1-1/2 inch in diameter at the base of the cutting

   Cut the top of each willow cutting square above a leaf bud. Cut the base below a leaf bud at approximately a 45 degree angle. Trim off leaves and branches flush with the stem of the cutting.

20-3.01B(2)(b)(iv) Cottonwood Cuttings
   Cottonwood cuttings must comply with the requirements for willow cuttings in section 20-3.01B(2)(b)(iii).

20-3.01B(2)(b)(v)–20-3.01B(2)(b)(viii) Reserved

20-3.01B(2)(c) Sod
   Sod must:
   1. Be grown to comply with the Food & Agri Code
   2. Be free from weeds and undesirable types of grasses and clovers
   3. Be field-grown on soil containing less than 50 percent silt and clay
   4. Have less than 1/2-inch-thick thatch
   5. Be not less than 8 months or more than 16 months old
   6. Be machine-cut to a uniform soil thickness of 5/8 ± 1/4 inch, not including top growth and thatch

   Protect sod with tarps or other protective covers during delivery. Do not allow sod to dry out during delivery or before placement.

20-3.01B(3) Soil Amendment
   Soil amendment must comply with the requirements in the Food & Agri Code. Soil amendment must be one or a combination of the following:
   1. Sphagnum peat moss
   2. Nitrolized fir bark
   3. Vermiculite
   4. Perlite
20-3.01B(4) Fertilizers
20-3.01B(4)(a) General
Deliver fertilizer in labeled containers showing weight, chemical analysis, and manufacturer's name.
Fertilizer must comply with the requirements of the Food & Agri Code.

20-3.01B(4)(b) Slow-release Fertilizers
Slow-release fertilizer must be a pelleted or granular form with a nutrient release over an 8 to 12 month period and must comply with the chemical analysis ranges shown in the following table:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Content (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (N)</td>
<td>16–21</td>
</tr>
<tr>
<td>Phosphoric acid (P)</td>
<td>6–8</td>
</tr>
<tr>
<td>Water soluble potash (K)</td>
<td>4–10</td>
</tr>
</tbody>
</table>

20-3.01B(4)(c) Packet Fertilizers
Packet fertilizer must be a biodegradable packet with a nutrient release over a 12 month period. Each packet must have a weight of 10 ± 1 grams and must comply with the chemical analysis shown in the following table:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Content (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (N)</td>
<td>20</td>
</tr>
<tr>
<td>Phosphoric acid (P)</td>
<td>10</td>
</tr>
<tr>
<td>Water soluble potash (K)</td>
<td>5</td>
</tr>
</tbody>
</table>

20-3.01B(4)(d) Organic Fertilizers
Organic fertilizer must be pelleted or granular with a cumulative nitrogen release rate of no more than 70 percent for the first 70 days after incubation at 86 degrees F with 100 percent at 350 days or more. Organic fertilizer must comply with the chemical analysis shown in the following table:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Content (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen (N)</td>
<td>5–7</td>
</tr>
<tr>
<td>Phosphoric acid (P)</td>
<td>1–5</td>
</tr>
<tr>
<td>Water soluble potash (K)</td>
<td>1–10</td>
</tr>
</tbody>
</table>

20-3.01B(5) Root Stimulants
Root stimulant must be a commercial quality product.

20-3.01B(6) Plaster Sand
Backfill material for the transplant palm tree planting holes must be 100 percent commercial quality washed plaster sand.

20-3.01B(7) Root Barrier
Root barrier must be an injection molded or extruded modular panel made of high-density polypropylene or polyethylene plastic.
Each panel must:
1. Be at least 1/16-inch thick
2. Have at least 4 molded root-deflecting vertical ribs 0.5- to 0.8-inch wide, 6 to 8 inches apart
3. Have a locking strip or an integral male-female sliding lock designed to resist slippage between panels
4. Be at least 2 feet wide and 2 feet in depth
20-3.01B(8) Root Protectors
Each root protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Closed bottom design with a height and diameter that provides a minimum of 6 inches of clearance between the root ball and the sides and bottom of the wire cylinder

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points.

20-3.01B(9) Foliage Protectors
Each foliage protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Approximately 4 feet high and 2 feet in diameter

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points. Other wire edges that are cut must be free of sharp points.

Support stakes must be one of the following:

1. 3/4-inch reinforcing steel bar a minimum of 5 feet long with an orange or red plastic safety cap that fits snugly onto the top of the reinforcing steel bar
2. 2 inch nominal diameter or 2 by 2 inch nominal size wood stakes a minimum of 5 feet long. Wood stakes must be straight

The jute mesh cover must comply with section 21-1.02O(2). Twine required to hold the jute mesh cover in place must be 1/8-inch diameter manila hemp twine.

20-3.01B(10) Wood Plant Stakes
Each plant stake must be nominal 2 by 2 inch or nominal 2-inch diameter and of sufficient length to keep the plant in an upright position.

Plant stakes for vines must be nominal 1 by 1 inch, 18 inches long.

20-3.01B(11) Plant Ties
Plant ties must be extruded vinyl-based tape, 1 inch wide and at least 10 mils thick.

20-3.01C Construction
20-3.01C(1) General
Apply a root stimulant under the manufacturer's instructions to the plants specified in the special provisions.

Before transporting the plants to the planting area, thoroughly wet the root ball.

20-3.01C(2) Pruning
Prune plants under the latest edition of ANSI A300 part 1, *Pruning*, published by the Tree Care Industry Association.

Do not use tree seal compounds to cover pruning cuts.

20-3.01C(3) Watering
Water existing plants to be maintained, transplanted trees, and new plants as needed to keep the plants in a healthy growing condition.

20-3.01C(4) Replacement Plants
Plants that show signs of failure to grow at any time or are so injured or damaged as to render them unsuitable for the purpose intended, must be removed, replaced, and replanted. Replace unsuitable plants within 2 weeks after the Engineer marks or indicates that the plants must be replaced.

Replacement planting must comply with the original planting requirements, spacing, and size provisions described for the plants being replaced.
Replacement planting for transplanted trees must comply with the work plan and be planted in the same planting hole.

Replacement ground cover plants must be the same species specified for the ground cover being replaced. Other replacement plants must be the same species as the plants being replaced.

Place orders for replacement plants with the vendor at the appropriate time so that the replacement plants are not in a root-bound condition.

The Department does not pay for replacement plants or the planting of replacement plants.

20-3.01C(5) Maintain Plants
Maintain plants from the time of planting until Contract acceptance if no plant establishment period is specified or until the start of the plant establishment period.

20-3.01D Payment
Reserved

20-3.02 EXISTING PLANTING
20-3.02A General
20-3.02A(1) Summary
Section 20-3.02 includes specifications for pruning existing plants, transplanting trees, and maintaining existing planted areas.

Transplant palm trees between March 15 and October 15.

20-3.02A(2) Definitions
Reserved

20-3.02A(3) Submittals
Submit a work plan for:

1. Transplanting trees. The work plan must include methods for lifting, transporting, storing, planting, guying, and maintaining each tree to be transplanted. Include root ball size, method of root ball containment, and a maintenance program for each tree.
2. Maintaining existing planted areas. The work plan must include weed control, fertilization, mowing and trimming of turf areas, watering, and controlling rodents and pests.

Submit a copy of the manufacturer's product sheet for root stimulant including application instructions.

20-3.02A(4) Quality Control and Assurance
Inspect for deficiencies of existing planted areas in the presence of the Engineer. Complete the inspection within 15 days after the start of job site activities.

Deficiencies requiring corrective action include:

1. Weeds
2. Dead, diseased, or unhealthy plants
3. Missing plant stakes and tree ties
4. Inadequate plant basins and basin mulch
5. Other deficiencies needing corrective action to promote healthy plant life
6. Rodents and pests

20-3.02B Materials
Not Used

20-3.02C Construction
20-3.02C(1) General
Correct deficiencies of existing planted areas as ordered within 15 days of the order. Correction of deficiencies is change order work.
After deficiencies are corrected, perform work to maintain existing planted areas in a neat and presentable condition and to promote healthy plant growth through Contract acceptance.

20-3.02C(2) Prune Existing Plants
Prune existing plants as shown.

If no bid item for prune existing plants is included, prune existing plants as ordered. Pruning existing plants is change order work.

20-3.02C(3) Transplant Trees
Prune each tree to be transplanted immediately before lifting.

If the tree to be transplanted is a palm, prune by removing dead fronds and frond stubs from the trunk. Remove green fronds up to 2 rows of fronds away from the center of growth. Tie the remaining 2 rows of fronds in an upright position with light hemp or manila rope. Remove fronds and frond stubs at the trunk in a manner that will not injure the trunk. Remove fronds and frond stubs for Phoenix dactylifera (Date Palm) approximately 4 inches from the trunk.

Prepare each hole in the new location before lifting the tree to be transplanted.

Lift tree to be transplanted as described in the work plan.

Comply with section 20-3.03C(3) for handling and planting each tree to be transplanted.

Until replanted, cover exposed root ball with wet burlap or canvas and cover the crown with 90 percent shade cloth.

Replant each tree on the same day it is lifted if possible. If the transplant location is not ready to receive the tree, store and maintain the tree to be transplanted until the transplant location is authorized. Store tree in an upright position.

Replace damaged transplanted tree under 20-3.01C(4) and with the number of trees specified in the special provisions.

The replacement trees must be planted in individual plant holes at the location determined by the Engineer within the area of the tree being replaced. Comply with section 20-3.03C(2) for the planting of the replacement trees.

20-3.02C(4) Maintain Existing Planted Areas
If a bid item for maintain existing planted areas is included, the existing plant basins must be kept well-formed and free of sediment. If the existing plant basins need repairs, and the basins contain mulch, replace the mulch after the repairs are done.

Control weeds within the existing planted area and:

1. From the existing planted area limit to the adjacent edges of paving and fences if less than or equal to 12 feet
2. From the existing planted area limit to 6 feet beyond the outer limit of the existing planted area if the adjacent edge of paving or fence is more than 12 feet away
3. Within a 3-foot radius from each existing tree and shrub

If no bid item for maintain existing planted areas is included, maintain existing planted areas as ordered. Maintain existing planted areas is change order work.

20-3.02D Payment
Not Used

20-3.03 PLANTING WORK

20-3.03A General
Section 20-3.03 includes specifications for planting plants.

20-3.03B Materials
Not Used
20-3.03C  Construction
20-3.03C(1)  General
Do not begin planting until authorized.

If an irrigation system is required, do not begin planting in an area until the functional test has been completed and authorized for the irrigation system serving that area.

20-3.03C(2)  Preparing Planting Areas
The location of each plant is as shown unless the Engineer designates otherwise. If the Engineer designates the location, it will be marked by a stake, flag, or other marker.

Conduct work so the existing flow line in drainage ditches is maintained. Material displaced by your operations that interferes with drainage must be removed.

Where a minimum distance to a drainage ditch is shown, locate the plant so that the outer edge of its basin wall is at least the minimum distance shown for each plant involved.

Excavate each planting hole by hand digging or by drilling. The bottom of each planting hole must be flat. Do not use water for excavating the hole.

Unless a larger planting hole is specified, the planting hole must be large enough to receive the root ball or the total length and width of roots, backfill, amendments, and fertilizer. Where rock or other hard material prohibits the hole from being excavated, a new hole must be excavated and the abandoned hole backfilled.

20-3.03C(3)  Planting Plants
20-3.03C(3)(a)  General
Do not plant plants in soil that is too wet, too dry, not properly conditioned as specified, or in an unsatisfactory condition for planting.

Do not distribute more plants than can be planted and watered on that day.

Water plants immediately after planting. Apply water until the backfill soil around and below the roots or ball of earth around the roots of each plant is thoroughly saturated. When watering with a hose, use a nozzle, water disbursement device, or pressure reducing device. Do not allow the full force of the water from the open end of the hose to fall within the basin around any plant. Groundcover plants in areas with an irrigation system must be watered by sprinklers. Several consecutive watering cycles may be necessary to thoroughly saturate the soil.

If shown, install root barriers between trees and concrete sidewalk or curb. Install panels flush with finished grade and join with locking strips or integral male-female sliding locks. Install barriers with root deflectors facing inward.

If a tree grate is shown, install root barrier panels 0.5 inch above finish grade or as shown.

Adjust planting locations so that each tree or shrub is at least 8 feet away from any sprinkler.

Where a tree, shrub, or vine is to be planted within a groundcover area or cutting planting area, plant it before planting groundcover or cuttings.

Where shrubs and groundcovers are shown to be planted in groups, the outer rows directly adjacent to the nearest roadway or highway fence must be parallel to the nearest roadway or highway fence. Stagger shrubs and groundcovers in adjacent rows. Adjust the alignment of the plants within the outer rows.

Core holes in concrete masonry block wall as shown.

Where a vine is to be planted against a wall or fence, plant it as close as possible to the wall or fence. If a vine planted next to a wall is to be staked, stake and tie the vine at the time of planting. A vine planted next to a fence must be tied to the fence at the time of planting.

Protect tree trunks from injury. Do not:

1. Drag tree
2. Use chains to move a tree
3. Lay tree on the ground
20-3.03C(3)(b) Trees, Shrubs, and Vines

After preparing holes, thoroughly mix soil amendment and granular fertilizer at the rate shown with native soil to be used as backfill material. Remove containers from plants in such a manner that the ball of earth surrounding the roots is not broken. Do not cut plant containers before delivery of the plants to the planting area. Plant and water plants immediately after removal from their containers.

Place packet fertilizer in the backfill within 6 to 8 inches of the ground surface and approximately 1 inch from the root ball. If more than 1 packet is required per plant, distribute the packets evenly around the root ball.

If a root stimulant is to be used, apply it according to the manufacturer’s instructions.

If required, install root protectors in the plant holes as shown.

Ensure roots are not restricted or distorted.

Distribute backfill uniformly throughout the entire depth of the plant hole without clods or lumps. After the planting holes have been backfilled, jet water into the backfill with a pipe or tube inserted into the bottom of the hole until the backfill material is saturated for the full depth. If the backfill material settles below this level, add additional backfill to the required level. If a plant settles deeper than shown, replant it at the required level.

Remove nursery stakes after planting.

Install 2 plant stakes for each plant to be staked at the time of planting as shown. Ensure the rootball is not damaged.

Tie the plant to the stakes with 2 plant ties, 1 tie to each stake. Each tie must form a figure 8 by crossing the tie between the plant and the stake as shown. Install ties at the lowest position that will support the plant in an upright position. Ties must provide trunk flexibility but 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.

Construct a watering basin around each plant as shown.

If required, install a foliage protector:

1. Over the plant within 2 days after planting.
2. Vertically and centered over the plant as shown

If foliage protectors are required:

1. Cut the bottom of the wire cylinder to match the slope of the ground. Do not leave sharp points of wire after cutting. Sharp points must be bent over or blunted.
2. Install 2 support stakes for foliage protectors vertically and embed in the soil on opposite sides of the plant as shown and in a transverse direction to the prevailing wind.
3. Either weave the support stakes through the wire cylinder mesh at 6 inch maximum centers or fasten the wire cylinder to the support stakes at 6 inch maximum centers.
4. Wire cylinder must be snug against the support stakes but loose enough to be raised for pesticide application or to perform weeding within the plant basin.
5. Install jute mesh cover over the foliage protector and secure with twine as shown.

20-3.03C(3)(c) Groundcover Plants

Each groundcover planting area irrigated by a single control valve must be completely planted and watered before planting other groundcover planting areas.

Plant groundcover plants in moist soil, and in neat, straight rows, spaced as shown.

Apply fertilizer to groundcover plants and water into the soil immediately after planting.

20-3.03C(3)(d) Cuttings, Liners, Plugs, and Seedling Plants

20-3.03C(3)(d)(i) General

Apply fertilizer to cuttings, liners, plugs, and seedling plants and water immediately after planting.

Ensure the soil is moist to a minimum depth of 8 inches before planting cuttings.
If a root stimulant is to be used, apply it according to the manufacturer's instructions.

20-3.03C(3)(d)(ii) Willow Cuttings

Unless otherwise shown, for willow cuttings excavate planting holes perpendicular to the ground line by using a steel bar, auger, post hole digger, or similar tools. Holes must be large enough to receive the cuttings and fertilizer packet. Plant willow cuttings to the specified depths without damaging the bark.

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

Plant willow cuttings during the period specified in the special provisions.

Apply root stimulant according to the manufacturer's instructions.

Plant the base of the cutting 10 to 12 inches deep with 3 to 5 bud scars exposed above the ground. If more than 5 bud scars are exposed, trim off the excess willow cutting length.

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

Backfill the plant holes with excavated material after planting. Distribute the excavated material evenly within the hole without clods, lumps, or air pockets. Compact the backfill so that the cutting cannot be easily removed from the soil. Do not damage the cutting's bark.

Dispose of trimmings and unused cuttings.

20-3.03C(3)(d)(iii) Cottonwood Cuttings

Reserved

20-3.03C(3)(d)(iv) Carpobrotus and Delosperma Cuttings

Plant Carpobrotus cuttings to a depth so that not less than 2 nodes are covered with soil. The basal end of Delosperma cuttings must not be less than 2 inches below the surface of the soil and the basal end of Carpobrotus cuttings must not be less than 4 inches below the surface of the soil.

Apply root stimulant to Delosperma cuttings before planting.

Do not plant Carpobrotus or Delosperma cuttings in soil that does not contain sufficient moisture at an average depth of 2 inches below the surface.

20-3.03C(3)(d)(v) Liner Plants

Plant liner plants during the period specified in the special provisions.

If a foliage protector is required, install under section 20-3.03C(3)(b).

20-3.03C(3)(d)(vi) Plug Plants

Plant plug plants during the period specified in the special provisions.

20-3.03C(3)(d)(vii) Seedling Plants

Plant seedling plants during the period specified in the special provisions.

20-3.03C(3)(e) Sod

After all other planting is performed, grade sod areas to drain and to a smooth and uniform surface. Fine grade and roll sod areas before placing sod.

Areas adjacent to sidewalks, edging, and other paved borders and surfaced areas must be 1 inch below the finished surface elevation of the facilities, after fine grading, rolling, and settlement of the soil.

Place sod such that the end of each adjacent strip is staggered a minimum of 2 feet. Place the edge and end of sod firmly against adjacent sod and against sidewalks, edging, and other paved borders and surfaced areas.

Lightly roll the entire sodded area to eliminate air pockets and ensure close contact with the soil after placement of sod. Water the sodded areas so that the soil is moist to a minimum depth of 4 inches after rolling. Do not allow the sod to dry out.
If irregular or uneven areas appear in the sodded areas, restore to a smooth and even appearance.

Trim sod to a uniform edge at sidewalks, edging, and other paved borders and surfaced areas. Trimming must be repeated whenever the edge of sod extends 1 inch beyond the edge of the edging, sidewalks, and other paved borders and surfaced areas. Remove and dispose of trimmed sod.

Mow sod when it has reached a height of 4 inches. Mow sod to a height of 2.5 inches.
Submit updated watering schedules within 5 business days after any changes have been made to the authorized schedules.

Submit a revised watering schedule for each irrigation controller not less than 30 days before completion of the plant establishment period.

20-4.01C(2) Notification
The Engineer will notify you in writing when the plant establishment period begins and will furnish statements regarding the number of working days credited to the plant establishment period after the notification.

Notify the Engineer at least 5 business days before applying each application of fertilizer.

20-4.01D Quality Control and Assurance
Provide training by a qualified person on the use and adjustment of the irrigation controllers installed, 30 days before completion of the plant establishment period.

Perform a final inspection of the plant establishment work in the presence of the Engineer between 20 and 30 days before Contract acceptance.

20-4.02 MATERIALS
20-4.02A General
Reserved

20-4.02B Fertilizers
Fertilizer must comply with section 20-3.01B(5).

20-4.03 CONSTRUCTION
20-4.03A General
Remove trash and debris.

Surplus earth accumulated in roadside clearing and planting areas must be removed.

Trim and mow turf areas as specified for sod in section 20-3.03C(3)(e). Dispose of trimmed and mowed material.

If irregular or uneven areas appear within turf areas, restore to a smooth and even appearance. Reseed turf seed areas.

Remove the tops of foliage protectors if plants become restricted.

Remove foliage protectors, including support stakes, within 30 days before the completion of the plant establishment period.

Keep plant basin walls well formed.

Clean new wye strainers and existing wye strainers that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

Remove, clean, and reinstall new filters and existing filters that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

20-4.03B Plant Growth Control
Prune plants planted as part of the Contract as authorized.

Remove plant growth that extends within 2 feet of sidewalks, curbs, dikes, shoulders, walls or fences.

Remove proposed and existing ground cover from within the plant basins, including basin walls, turf areas, and planting areas within edging.

Vines next to walls and fences must be kept staked and tied. Train vines on fences and walls or through cored holes in walls.
20-4.03C Fertilizers
Apply fertilizer to the plants as specified and water into the soil after each application.
Apply fertilizer at the rates shown and spread with a mechanical spreader, whenever possible.

20-4.03D Weed Control
Control weeds under section 20-1.03C(3).

20-4.03E Plant Staking
Replace the plant stakes that are inadequate to support plants with larger stakes.
Remove plant stakes when the Engineer determines they are no longer needed.

20-4.03F Replacement Plants
Replacement plants must comply with section 20-3.01C(4).

Replacement of plants up to and including the 125th plant establishment working day must be with a plant of the same size as originally specified. Plants of a larger container size than those originally specified for replacement plants may be used during the first 125 working days of the plant establishment period.

Replacement of plants after the 125th plant establishment working day must comply with the following size requirements:

<table>
<thead>
<tr>
<th>Plant size (Original)</th>
<th>Plant size (Replacement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pot/liner/plug/seedling</td>
<td>No. 1 container</td>
</tr>
<tr>
<td>No. 1 container</td>
<td>No. 5 container</td>
</tr>
<tr>
<td>No. 5 container</td>
<td>No. 15 container</td>
</tr>
</tbody>
</table>

Other replacement plants must be the same size as originally specified.
Replacement ground cover plants must comply with the following spacing requirements:

<table>
<thead>
<tr>
<th>Original spacing (inches)</th>
<th>On center spacing of replacement ground cover plants (inches)</th>
<th>Number of completed plant establishment working days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1–125</td>
<td>126–190</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>36</td>
<td>36</td>
<td>24</td>
</tr>
</tbody>
</table>

20-4.03G Watering
Operate the electric automatic irrigation systems in the automatic mode unless authorized.
If any component of the electric automatic irrigation system is operated manually, the day will not be credited as a plant establishment working day unless the manual operation is authorized.

Water plants utilizing the remote irrigation control system software program unless authorized.
Implement the watering schedule at least 10 days before completion of the plant establishment period.
20-5 LANDSCAPE ELEMENTS

20-5.01 GENERAL
20-5.01A General
Section 20-5 includes specifications for constructing and installing landscape elements.

20-5.01B Materials
Not Used

20-5.01C Construction
Earthwork must comply with section 19.

20-5.01D Payment
Not Used

20-5.02 EDGING
20-5.02A General
Section 20-5.02 includes specifications for constructing landscape edging.

20-5.02B Materials
20-5.02B(1) General
Reserved

20-5.02B(2) Header Board Edging
Lumber for header board edging must be one of the following types:
1. Construction grade cedar
2. Pressure-treated Douglas fir
3. Construction heart grade redwood complying with section 57-2.01B(2)

Lumber must be:
1. Rough cut from sound timber.
2. Straight. Sweep must not exceed 1 inch in 6 feet.
3. Free from loose or unsound knots. Knots must be sound, tight, well spaced, and not to exceed 2 inches in size on any face.
4. Free of shakes in excess of 1/3 the thickness of the lumber.
5. Free of splits longer than the thickness of the lumber.
6. Free of other defects that would render the lumber unfit structurally for the purpose intended.

Edging anchors for header board edging must be stakes of the size and shape shown.

20-5.02B(3) Metal Edging
Metal edging must be commercial quality, made of aluminum or steel, and have an L-shaped design. Edging must be a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for the use intended.

Edging anchors must be from the same manufacturer as the metal edging.

20-5.02B(4) High Density Polyethylene Edging
HDPE edging must be commercial quality and a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for commercial installation for the use intended.

Edging anchors must be from the same manufacturer as HDPE edging.

20-5.02B(5) Concrete Edging
Concrete for edging must be minor concrete.
Where edging is used to delineate the limits of inert ground cover or mulch areas, install edging before installing inert ground cover or mulch areas.

Saw cut surfaces where (1) asphalt concrete or concrete surfacing must be removed to permit the installation of edging and (2) no joint exists between the surfacing to be removed and the surfacing to remain in place. The surfacing must be cut in a straight line to a minimum depth of 2 inches with a power-driven saw before the surfacing is removed. Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

**20-5.02C(2) Header Board Edging**

Each stake must be driven flush with the top edge of the header board edging and the stake top must be beveled away from the header board at a 45 degree angle. Attach stake to header board with a minimum of two 12-penny hot dipped galvanized nails per stake.

**20-5.02C(3) Metal and High Density Polyethylene Edging**

Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

**20-5.02C(4) Concrete Edging**

Construct and finish minor concrete edging under section 73-2.

**20-5.03 INERT GROUND COVERS AND MULCHES**

**20-5.03A General**

**20-5.03A(1) General**

**20-5.03A(1)(a) Summary**

Section 20-5.03 includes specifications for installing inert ground covers and mulches.

**20-5.03A(1)(b) Definitions**

Reserved

**20-5.03A(1)(c) Submittals**

Submit:
1. Filter fabric product data including the manufacturer's product sheet and installation instructions
2. Certificate of compliance for filter fabric at least 5 business days before delivery of the material to the job site

**20-5.03A(1)(d) Quality Control and Assurance**

Reserved

**20-5.03A(2) Materials**

Soil sterilant must be oxadiazon granular preemergent and must comply with section 20-1.02C.

Filter fabric must be Class A. Staples for filter fabric must comply with section 21-1.02R.

**20-5.03A(3) Construction**

**20-5.03A(3)(a) General**

Before performing inert ground cover and mulch work, remove plants and weeds to ground level.

**20-5.03A(3)(b) Earthwork**

Excavate areas to receive inert ground cover or mulch to the depth shown. Maintain the planned flow lines, slope gradients, and contours of the job site. Grade subgrade to a smooth and uniform surface and compact to not less than 90 percent relative compaction.
20-5.03A(3)(c) Treatment of Soil
After compaction, apply soil sterilant at the maximum label rate. Do not apply soil sterilant more than 12 inches beyond the inert ground cover or mulch limits. The soil sterilant application and inert ground cover or mulch placement must be completed within the same work day.

20-5.03A(3)(d) Filter Fabric
Immediately before placing filter fabric, surfaces to receive filter fabric must be free of loose or extraneous material and sharp objects that may damage the filter fabric during installation.

Align fabric and place in a wrinkle-free manner.

Overlap adjacent rolls of the fabric from 12 to 18 inches. Spread each overlapping roll in the same direction. Fasten fabric with staples flush with the adjacent fabric to prevent movement of fabric by placement of inert ground cover or mulch.

Repair or replace fabric damaged during placement of inert ground cover or mulch with sufficient fabric to comply with overlap requirements.

20-5.03A(4) Payment
Not Used

20-5.03B Rock Blanket
20-5.03B(1) General
20-5.03B(1)(a) Summary
Section 20-5.03B includes specifications for placing rock blanket.

20-5.03B(1)(b) Definitions
Reserved

20-5.03B(1)(c) Submittals
Submit a 1 sq yd sample of the various rock sizes.

20-5.03B(1)(d) Quality Control and Assurance
Reserved

20-5.03B(2) Materials
20-5.03B(2)(a) General
Do not use filter fabric.

20-5.03B(2)(b) Concrete
Concrete must be minor concrete.

20-5.03B(2)(c) Rock
Rock must be clean, smooth, and obtained from a single source and must comply with the following grading requirements:

<table>
<thead>
<tr>
<th>Screen size (inches)</th>
<th>Percentage passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>50-85</td>
</tr>
<tr>
<td>4</td>
<td>0-50</td>
</tr>
</tbody>
</table>

20-5.03B(2)(d) Mortar
Mortar must comply with section 51-1.02F.

20-5.03B(3) Construction
Place concrete as shown.
Rock must be placed while concrete is still plastic. Remove concrete adhering to the exposed surfaces of the rock.

Loose rocks or rocks with a gap greater than 3/8 inch must be reset by an authorized method. The rock gap is measured from the edge of the rock to the surrounding concrete bedding.

Place mortar as shown.

20-5.03B(4) Payment
Rock blanket is measured parallel to the rock blanket surface.

20-5.03C Gravel Mulch
20-5.03C(1) General
20-5.03C(1)(a) Summary
Section 20-5.03C includes specifications for placing gravel mulch.

20-5.03C(1)(b) Definitions
Reserved

20-5.03C(1)(c) Submittals
Submit a 5-lb sample of the gravel mulch.

20-5.03C(1)(d) Quality Control and Assurance
Reserved

20-5.03C(2) Materials
Gravel mulch must be:

1. Uniform gray color
2. From a single source only
3. Crushed rock that complies with the following grading requirements:

<table>
<thead>
<tr>
<th>Grading Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve size</td>
</tr>
<tr>
<td>1-1/4 inch</td>
</tr>
<tr>
<td>3/4 inch</td>
</tr>
<tr>
<td>1/2 inch</td>
</tr>
<tr>
<td>No. 40</td>
</tr>
</tbody>
</table>

20-5.03C(3) Construction
Place gravel and compact by rolling.

The finished gravel mulch surface must be smooth and uniform, maintaining original flow lines, slope gradients, and contours of the job site.

20-5.03C(4) Payment
Gravel mulch is measured parallel to the gravel mulch surface.

20-5.03D Decomposed Granite
20-5.03D(1) General
20-5.03D(1)(a) Summary
Section 20-5.03D includes specifications for placing decomposed granite.

20-5.03D(1)(b) Definitions
Reserved

20-5.03D(1)(c) Submittals
Five business days before delivery of the materials to the job site, submit:
1. Solidifying emulsion product data including the manufacturers' product sheets and installation instructions
2. Certificate of compliance for solidifying emulsion
3. 5-lb sample of the decomposed granite

**20-5.03D(1)(d) Quality Control and Assurance**
Test plot must be:
1. Constructed at an authorized location
2. At least 3 by 12 feet
3. Constructed using the materials, equipment, and methods to be used in the work
4. Authorized before starting work

Notify the Engineer not less than 7 days before constructing the test plot.

The Engineer uses the authorized test plot to determine acceptability of the work.

If ordered, prepare additional test plots. Additional test plots are change order work.

If the test plot is not incorporated into the work, the Engineer may order you to remove it.

**20-5.03D(2) Materials**

**20-5.03D(2)(a) General**
Decomposed granite must be:
1. Uniform gray or tan color
2. From one source only
3. Crushed granite rock that complies with grading requirements shown in the following table:

<table>
<thead>
<tr>
<th>Sieve size</th>
<th>Percent passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inch</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>95–100</td>
</tr>
<tr>
<td>No. 8</td>
<td>75–80</td>
</tr>
<tr>
<td>No. 16</td>
<td>55–65</td>
</tr>
<tr>
<td>No. 30</td>
<td>40–50</td>
</tr>
<tr>
<td>No. 50</td>
<td>25–35</td>
</tr>
<tr>
<td>No. 100</td>
<td>20–25</td>
</tr>
<tr>
<td>No. 200</td>
<td>5–15</td>
</tr>
</tbody>
</table>

Note: Grading based upon AASHTO T11-82 and T27-82

**20-5.03D(2)(b) Solidifying Emulsion**
Solidifying emulsion must be either a water-based polymer or nontoxic organic powdered binder specifically manufactured to harden decomposed granite. The solidifying emulsion must not alter the decomposed granite color.

**20-5.03D(3) Construction**
Do not place decomposed granite during rainy conditions.

Mix solidifying emulsion thoroughly and uniformly throughout the decomposed granite and under the manufacturer's instructions. Mix the material in the field using portable mixing equipment, or delivered in mixer trucks from a local ready-mixed plant.

Place decomposed granite uniformly in layers no more than 1-1/2 inch thick. Compact each layer of decomposed granite to a relative compaction of not less than 90 percent. Begin compaction within 6 to 48 hours of placement.

If the material was mixed in the field, apply an application of solidifying emulsion after compaction as recommended by the manufacturer. Prevent runoff or overspray of solidifying emulsion onto adjacent paved or planting areas.
The finished decomposed granite surface must be smooth and uniform, compacted to a relative compaction of not less than 90 percent, maintaining original flow lines, slope gradients, and contours of the job site.

20-5.03D(4) Payment
Not Used

20-5.03E Wood Mulch

20-5.03E(1) General

20-5.03E(1)(a) Summary
Section 20-5.03E includes specifications for placing wood mulch.

20-5.03E(1)(b) Definitions
Reserved

20-5.03E(1)(c) Submittals
Submit a certificate of compliance for mulch.
Submit a 2 cu ft mulch sample with the mulch source listed on the bag and obtain approval before delivery of mulch to the job site.

20-5.03E(1)(d) Quality Control and Assurance
Reserved

20-5.03E(2) Materials

20-5.03E(2)(a) 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 other chemical residues harmful to plant or animal life.

Do not use filter fabric.

20-5.03E(2)(b) Tree Bark Mulch
Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.
Tree bark mulch must be ground so that at least 95 percent of the material by volume is less than 2 inches and no more than 30 percent by volume is less than 1 inch.

20-5.03E(2)(c) 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 wood chips by volume with average thickness of 1/16 to 3/8 inch in any direction and 1/2 to 3 inches in length

20-5.03E(2)(d) 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 wood strands by volume with average thickness of 1/8 to 1-1/2 inches in any direction and 2 to 8 inches in length

20-5.03E(2)(e) 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 material by volume less than 3 inches and no more than 30 percent by volume less than 1 inch
20-5.03E(2)(f)–20-5.03E(2)(j) Reserved
20-5.03E(3) Construction
Spread mulch placed in areas outside of plant basins to a uniform thickness as shown.

Mulch must be placed at the rate described and placed in the plant basins or spread in areas as shown after the plants have been planted. Mulch placed in plant basins must not come in contact with the plant crown and stem.

Spread mulch from the outside edge of the proposed plant basin or plant without basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the proposed plant or plant without basin is 12 feet or more from the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings, spread the mulch 6 feet beyond the outside edge of the proposed plant basin or plant without 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

20-5.03E(4) Payment
Mulch is measured in the vehicle at the point of delivery.

20-5.03F–20-5.03J Reserved
20-5.04 RESERVED
Reserved

20-5.05 SITE FURNISHINGS
20-5.05A General
Section 20-5.05 includes specifications for installing site furnishings.

20-5.05B–20-5.05Z Reserved
20-5.06–20-5.10 RESERVED

21 EROSION CONTROL
07-19-13
Replace ", bonded fiber matrix, and polymer-stabilized fiber matrix" in the 1st paragraph of section 21-1.01B with:

and bonded fiber matrix

04-20-12

Delete the last paragraph of section 21-1.02E.
Replace section 21-1.02F(2) with:

04-20-12

21-1.02F(2) Reserved
 Replace "20-7.02D(1)" in the 1st paragraph of section 21-1.02H with:

07-19-13

20-3.01B(4)

Replace section 21-1.02J with:

04-20-12

21-1.02J Reserved

Replace the row for organic matter content in the table in the 4th paragraph of section 21-1.02M with:

| Organic matter | TMECC 05.07-A | 30–100 |
Replace the paragraph in section 21-1.02P with:

Fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Fiber roll must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end and must be one of the following:

1. 8 to 10 inches in diameter and at least 1.1 lb/ft
2. 10 to 12 inches in diameter and at least 3 lb/ft

Fiber roll must have a minimum functional longevity of 1 year.

Add between the 1st and 2nd paragraphs of section 21-1.03A:

Remove and dispose of trash, debris, and weeds in areas to receive erosion control materials.

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

Protect the traveled way, sidewalks, lined drainage channels, and existing vegetation from overspray of hydraulically-applied material.

Replace section 21-1.03B with:

21-1.03B Reserved

Replace "3 passes" in item 2 in the list in the 2nd paragraph of section 21-1.03G with:

2 passes

Replace section 21-1.03I with:

21-1.03I Reserved

Add between the 4th and 5th paragraphs of section 21-1.03P:

If soil conditions do not permit driving the stakes into the soil, drill pilot holes to facilitate driving of the stakes.

Delete the 1st and 2nd sentences of the 3rd paragraph in section 21-1.04.

28 CONCRETE BASES

Section 28 includes specifications for constructing new concrete base and replacing existing base.

Replace section 28-2 with:

28-2 LEAN CONCRETE BASE

28-2.01 GENERAL

28-2.01A Summary

Section 28-2 includes specifications for constructing lean concrete base (LCB).

28-2.01B Definitions

coarse aggregate: Aggregate retained on a no. 4 sieve.
**fine aggregate:** Aggregate passing a no. 4 sieve.

### 28-2.01C  Submittals

#### 28-2.01C(1)  General

At least 25 days before field qualification, submit the name of your proposed testing laboratory.

At least 10 days before field qualification, submit:

1. Aggregate qualification test results
2. Proposed aggregate gradation
3. Mix design, including:
   3.1. Proportions
   3.2. Types and amounts of chemical admixtures
4. Optional notice stating intent to produce LCB qualifying for a transverse contraction joint waiver under section 28-2.03D

Submittals for cementitious material must comply with section 90-1.01C(3).

Submit QC test results within 24 hours of test completion.

#### 28-2.01C(2)  Field Qualification

For each field qualification for each mix design, manufacture 12 specimens under ASTM C 31 and submit six of the specimens from 24 to 72 hours after manufacture. Use one batch for all 12 specimens.

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cu yd, the minimum is 5 cu yd
4. Type and source of ingredients used
5. Age and strength from compression strength results

Field qualification test reports must be signed by the official in responsible charge of the laboratory performing the tests.

### 28-2.01D  Quality Control and Assurance

#### 28-2.01D(1)  General

Stop LCB activities and immediately notify the Engineer whenever:

1. Any quality control or acceptance test result does not comply with the specifications
2. Visual inspection shows noncompliant LCB

If LCB activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant LCB
3. Obtain authorization

Molds for compressive strength testing under ASTM C 31 or ASTM C 192 must be 6 by 12 inches.

Quality control and assurance for cementitious materials and admixtures must comply with section 90-1.01D(1)

#### 28-2.01D(2)  Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. Qualification tests include (1) sand equivalent and (2) average 7-day compressive strength under ASTM C 39 on 3 specimens manufactured under ASTM C 192. The cement content for this test must be 300 lb/cu yd, and the 7-day average compressive strength must be at least 610 psi. Cement must be Type II portland cement under section 90-1.02B(2).

LCB must have from 3 to 4 percent air content during aggregate qualification testing.
28-2.01D(3) 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 authorized mixed designs.

Proposed mix designs must be field qualified before you place the LCB represented by those mix designs. Use an American Concrete Institute (ACI) certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized by the Engineer.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Quality Control Requirements."

Field qualification testing for compressive strength must comply with the following:

1. Manufacture 12 cylinders under ASTM C 31 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 C 39
3. 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 LCB for compressive strength at 3 days. Prepare compressive strength cylinders under ASTM C 31 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(4) Quality Control Testing

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

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

Perform quality control sampling, testing, and inspection throughout LCB production and placement. LCB must comply with the requirements for the quality characteristics shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum sampling and testing frequency</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand equivalent (min)</td>
<td>ASTM D 2419</td>
<td>1 per 500 cubic yards but at least 1 per day of production</td>
<td>18</td>
</tr>
<tr>
<td>Aggregate gradation</td>
<td>ASTM C 136</td>
<td></td>
<td>Note a</td>
</tr>
<tr>
<td>Air content (max, percent) b</td>
<td>ASTM C 231</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Penetration (inches)</td>
<td>ASTM C 360</td>
<td></td>
<td>0 to 1-1/2 nominal c, d</td>
</tr>
<tr>
<td>Slump (inches)</td>
<td>ASTM C 143</td>
<td></td>
<td>0–3 nominal c, d</td>
</tr>
<tr>
<td>Compressive strength (min, psi at 7 days)</td>
<td>ASTM C 39 e</td>
<td></td>
<td>530</td>
</tr>
<tr>
<td>Compressive strength (max, psi at 3 days) f</td>
<td>ASTM C 39 e</td>
<td></td>
<td>500</td>
</tr>
</tbody>
</table>

a Comply with the table titled "Aggregate Grading" in section 28-2.02C.
b If no single test in the first 5 air content tests exceeds 1-1/2 percent, no further air content tests are required.
c Maximum penetration must not exceed 2 inches and maximum slump must not exceed 4 inches.
d Test for either penetration or slump.
e Prepare cylinders under ASTM C 31.
f Only applicable if you (1) submitted a notice stating intent to produce LCB qualifying for a transverse contraction joint waiver and (2) successfully field qualified the LCB for 3-day compressive strength. Make cylinders at the same time using the same material and procedures as QC testing for 7-day compressive strength.
28-2.01D(5) Acceptance Criteria
For acceptance, properties of LCB must comply with values shown in the following table:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength (min, psi at 7 days)</td>
<td>ASTM C 39*</td>
<td>530^b</td>
</tr>
</tbody>
</table>

* Cylinders prepared under ASTM C 31
^ 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.

28-2.02 MATERIALS

28-2.02A General
Water must comply with section 90-1.02D.

The air content in LCB must not exceed 4 percent. If the aggregate used for LCB is produced from processed reclaimed asphalt concrete or other material that may cause the air content to exceed 4 percent, reduce the air content with an admixture.

A water-reducing chemical admixture may be used. Water-reducing chemical admixture must comply with ASTM C 494, Type A or Type F.

Air-entraining admixtures must comply with section 90-1.02E.

28-2.02B Cementitious Material
Portland cement must comply with section 90-1.02B. Portland cement content must not exceed 300 lb/cu yd.

SCM must comply with section 90-1.02B except the equations for SCM content under 90-1.02B(3) do not apply.

For aggregate qualification testing, use Type II portland cement under section 90-1.02B(2) without SCM.

28-2.02C Aggregate
Aggregate must be clean and free from decomposed material, organic material, and other deleterious substances. Aggregate samples must not be treated with lime, cement, or chemicals before testing for sand equivalent.

Use either 1-1/2 inch or 1 inch grading. Do not change your selected aggregate grading without authorization.

When tested under ASTM C 136, the percentage composition by weight of the aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

<table>
<thead>
<tr>
<th>Sieve sizes</th>
<th>Percentage passing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-1/2&quot; maximum</td>
</tr>
<tr>
<td></td>
<td>Operating range</td>
</tr>
<tr>
<td>2&quot;</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>90-100</td>
</tr>
<tr>
<td>1&quot;</td>
<td>--</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>50-85</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>40-75</td>
</tr>
<tr>
<td>No. 4</td>
<td>25-60</td>
</tr>
<tr>
<td>No. 30</td>
<td>10-30</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-12</td>
</tr>
</tbody>
</table>

Aggregate must comply with the quality requirements shown in the following table:
If the aggregate grading or the sand equivalent test results, or both comply with contract compliance requirements but not 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.

**28-2.03 CONSTRUCTION**

**28-2.03A General**
Do not allow traffic or equipment on the LCB for at least 72 hours after the 1st application of the curing compound and completion of contraction joints. Limit traffic and equipment on the LCB to that is required for placing additional layers of LCB or paving.

**28-2.03B Subgrade**
Immediately before spreading LCB, the subgrade must:

1. Comply with the specified compaction and elevation tolerance for the material involved
2. Be free from loose or extraneous material
3. Be uniformly moist

Areas of subgrade lower than the grade established by the Engineer must be filled with LCB. The Department does not pay for filling low areas of subgrade.

**28-2.03C Proportioning, Mixing, and Transporting**
Proportion LCB under section 90-1.02F except aggregate does not have to be separated into sizes.

Mix and transport LCB under section 90-1.02G except the 5th and 7th paragraphs in section 90-1.02G(6) do not apply.

**28-2.03D Placing**
Place LCB under section 40-1.03H(1) except the 3rd paragraph does not apply.

Unless otherwise described, construct LCB in minimum widths of 12 feet separated by construction joints. For LCB constructed monolithically in widths greater than 26 feet, construct a longitudinal contraction joint offset no more than 3 feet from the centerline of the width being constructed.

Contraction joints must comply with section 40-1.03D(3).

Construct transverse contraction joints in intervals that result in LCB areas where the lengths and widths are within 20 percent of each other. Measure the widths from any longitudinal construction or longitudinal contraction joints.

The Engineer waives the requirement for transverse contraction joints if you:

1.Submitted a notice under 28-2.01C(1)
2.Successfully field qualified LCB for 3-day compressive strength testing
3.Submit QC test results for 3-day compressive strength under section 28-2.01D(4).

If concrete pavement will be placed on LCB, construct longitudinal construction and longitudinal contraction joints in the LCB. Provide at least 1 foot horizontal clearance from planned longitudinal construction and longitudinal contraction joints in the concrete pavement.

Do not mix or place LCB when the atmospheric temperature is below 35 degrees F. Do not place LCB on frozen ground.
28-2.03E Finishing
Place LCB under section 40-1.03H(4) or under section 40-1.03H(5) except where there are confined work areas and when authorized:

1. Spread and shape LCB using suitable powered finishing machines and supplement with hand work as necessary.
2. Consolidate LCB using high-frequency internal vibrators within 15 minutes after LCB is deposited on the subgrade.
3. Vibrate with care such that adequate consolidation occurs across the full paving width and do not use vibrators for extensive weight shifting of the LCB.

For LCB to be paved with HMA, before curing operation texture the LCB finished surface by dragging a broom, burlap, or a spring steel tine device. If using a spring steel tine device, the device must produce a scored surface with scores parallel or transverse to the pavement centerline. Texture at a time and in a manner that produces the coarsest texture for the method used.

For LCB to be paved with HMA, the finished surface must not vary more than 0.05 foot from the grade established by the Engineer.

Do not texture LCB that will be covered with concrete pavement. Before applying curing compound, finish LCB to a smooth surface free from mortar ridges and other projections.

For LCB to be paved with concrete pavement, the finished surface must not be above the grade, or more than 0.05 foot below the grade established by the Engineer.

The finished surface must be free from porous areas.

28-2.03F Curing
After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03K except for LCB to be paved with concrete pavement, comply with section 36-2. Apply curing compound to the area to be paved with concrete pavement:

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. Within 4 days after the first application, clean the surface and apply the second application.

Immediately repair damage to the curing compound or LCB.

28-2.03G Surfaces Not Within Tolerance
Where LCB will be paved with concrete pavement, remove the base wherever the surface is higher than the grade established by the Engineer and replace it with LCB. Where LCB will not be paved with concrete pavement, remove the base wherever the surface is higher than 0.05 foot above the grade established by the Engineer and replace it with LCB. If authorized, grind the surface with either a diamond or carborundum blade to within tolerance. After grinding LCB to be paved with concrete pavement and after all free water has left the surface, clean foreign material and grinding residue from the surface. Apply curing compound to the ground area at a rate of approximately 1 gal/150 sq ft.

Where the surface of LCB is lower than 0.05 foot from the grade established by the Engineer, remove the base and replace it with LCB or, if authorized, fill low areas according to the pavement material as follows:

1. For HMA pavement, fill low areas with HMA that complies with the specifications for the lowest layer of pavement. Do not fill low areas concurrently with the paving operation.
2. For concrete pavement, fill low areas with pavement concrete concurrent with the paving operation.

28-2.04 PAYMENT
LCB is measured from the dimensions shown.
Replace section 28-3 with:

28-3  RAPID STRENGTH CONCRETE BASE

Reserved

Replace section 28-4 with:

28-4  LEAN CONCRETE BASE RAPID SETTING

Reserved

Replace section 28-5 with:

28-5  CONCRETE BASE

Reserved

Add to section 28:

28-6–28-14  RESERVED
28-15  REPLACE BASE

Reserved

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DIVISION IV  SUBBASES AND BASES
29  TREATED PERMEABLE BASES

04-18-14

Replace "section 68-4.02C" in the 6th paragraph of section 29-1.03A with:

section 64-4.03

Replace the 1st paragraph of section 29-1.03B with:

Produce ATPB under section 39-1.02H, except a JMF is not required. Do not use RAP.

The temperature of the aggregate before adding the asphalt binder must be from 275 to 325 degrees F.

Do not store ATPB longer than 2 hours.

Combine aggregate with 2.5 percent asphalt binder by weight of dry aggregate. An increase or decrease in the asphalt content may be ordered after your proposed aggregate supply has been tested. If an ordered increase or decrease exceeds the specified amount of asphalt content by more than 0.1 percent by weight of dry aggregate, compensation for ATPB is determined by the total increase or decrease in asphalt.

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 amount 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 amount designated by the Engineer, less 0.7 lb of asphalt per 100 lb of dry aggregate.

Replace the introductory clause of the 2nd paragraph of section 29-1.03B with:

04-18-14

Equipment for spreading and compacting ATPB must comply with section 39-1.03B. Compact ATPB in 1 layer using one of the following methods:
Replace "3rd" in the 4th paragraph of section 29-1.03C with:

4th

Replace section 30 with:

30 RECLAIMED PAVEMENTS

30-1 GENERAL
Section 30 includes specifications for reclaiming the pavement section and constructing a base.

30-2 FULL DEPTH RECLAIMED—FOAMED ASPHALT
Reserved

30-3–30-6 RESERVED

DIVISION V SURFACINGS AND PAVEMENTS
Replace section 36 with:

36 GENERAL

36-1 GENERAL
Section 36 includes general specifications for constructing surfacings and pavements.

36-2 BASE BOND BREAKER
Reserved

36-3–36-15 RESERVED

39 HOT MIX ASPHALT

39-1 GENERAL

39-1.01 GENERAL
39-1.01A Summary
Section 39-1 includes general specifications for producing and placing hot mix asphalt.

HMA includes one or more of the following types:

1. Type A HMA
2. RHMA-G
3. OGFC
4. BWC
5. Minor HMA

If a warm mix asphalt technology is specified, the warm mix asphalt technology to be used must be authorized. For Department-authorized warm mix asphalt technologies, go to the METS website.

39-1.01B Definitions
binder replacement: Binder from RAP expressed as a percent of the total binder in the mix.
**coarse aggregate**: Aggregate retained on a no. 4 sieve.

**fine aggregate**: Aggregate passing the no. 4 sieve.

**leveling course**: Thin layer of HMA used to correct minor variations in the longitudinal and transverse profile of the pavement before placement of other pavement layers.

**lower course**: Layer of HMA below 0.2 feet from finished grade exclusive of OGFC.

**miscellaneous areas**: Areas outside the traveled way such as:

1. Median areas not including inside shoulders
2. Island areas
3. Sidewalks
4. Gutters
5. Ditches
6. Overside drains
7. Aprons at ends of drainage structures

**processed RAP**: RAP that has been fractionated.

**supplemental fine aggregate**: Aggregate passing the no. 30 sieve, including hydrated lime, portland cement, and fines from dust collectors.

**surface course**: Upper 0.2 feet of HMA exclusive of OGFC.

**top layer**: Final riding surface.

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### 39-1.01C Submittals

#### 39-1.01C(1) General

Reserved

#### 39-1.01C(2) Job Mix Formula

#### 39-1.01C(2)(a) General

Except for the HMA to be used in miscellaneous areas and dikes, submit your proposed JMF for each type of HMA to be used. The JMF must be submitted on the Contractor Job Mix Formula Proposal form along with:

1. Mix design documentation on Contractor Hot Mix Asphalt Design Data form dated within 12 months of submittal
2. JMF verification on a Caltrans Hot Mix Asphalt Verification form, if applicable
3. JMF renewal on a Caltrans Job Mix Formula Renewal form, if applicable
4. MSDS for:
   4.1. Asphalt binder
   4.2. Supplemental fine aggregate except fines from dust collectors
   4.3. Antistrip additives

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

If you cannot submit a Department-verified JMF on a Caltrans Hot Mix Asphalt Verification form dated within 12 months before HMA production, the Engineer verifies the JMF.

Submit a new JMF if you change any of the following:

1. Target asphalt binder percentage greater than ±0.2 percent
2. Asphalt binder supplier
3. Combined aggregate gradation
4. Aggregate sources
5. Liquid antistrip producer or dosage
6. Average binder content in a new fractionated RAP stockpile by more than ±2.0 percent from the average RAP binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
7. Average maximum specific gravity in a new fractionated RAP stockpile by more than ±0.060 from the average maximum specific gravity value reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
8. Any material in the JMF

Allow the Engineer 5 business days from a complete JMF submittal for document review of the aggregate qualities, mix design, and JMF. The Engineer notifies you if the proposed JMF submittal is accepted.

If your JMF fails verification testing, submit an adjusted JMF based on your testing. An adjusted JMF requires a new Contractor Job Mix Formula Proposal form and Contractor Hot Mix Asphalt Design Data form and verification of a plant-produced sample.

You may submit an adjusted aggregate gradation TV on a Contractor Job Mix Formula Proposal form before verification testing. Aggregate gradation TV must be within the TV limits specified.

39-1.01C(2)(b) Job Mix Formula Renewal

You may request a JMF renewal by submitting:

1. Proposed JMF on a Contractor Job Mix Formula Proposal form
2. Previously verified JMF documented on a Caltrans Hot Mix Asphalt Verification form dated within 12 months
3. Mix design documentation on a Contractor Hot Mix Asphalt Design Data form used for the previously verified JMF

39-1.01C(2)(c) Job Mix Formula Modification

For an authorized JMF, submit a modified JMF if you change any of the following:

1. Asphalt binder supplier
2. Liquid antistrip producer
3. Liquid antistrip dosage

You may change any of the above items only once during the Contract.

Submit your modified JMF request a minimum of 15 days before production. Each modified JMF submittal must consist of:

1. Proposed modified JMF on Contractor Job Mix Formula Proposal form, marked Modified.
2. Mix design records on Contractor Hot Mix Asphalt Design Data form for the authorized JMF to be modified.
3. JMF verification on Hot Mix Asphalt Verification form for the authorized JMF to be modified.
4. Test results for the modified JMF in compliance with the mix design specifications. Perform tests at the mix design OBC as shown on the Contractor Asphalt Mix Design Data form.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 10 days of receiving all verification samples.

39-1.01C(3) Quality Control Plan

With your proposed JMF submittal, submit a QC plan for HMA.

The QC plan must describe the organization and procedures for:

1. Controlling HMA quality characteristics
2. Taking samples, including sampling locations
3. Establishing, implementing, and maintaining QC
4. Determining when corrective actions are needed
5. Implementing corrective actions
6. Methods and materials for backfilling core locations

The QC plan must address the elements affecting HMA quality including:

1. Aggregate
2. Asphalt binder
3. Additives
4. Production
5. Paving

The QC plan must include aggregate QC sampling and testing during lime treatment.
The Engineer reviews the QC plan within 5 business days from the submittal. Do not start HMA production until the Engineer authorizes the plan.

If QC procedures, personnel, tester qualifications, sample testing locations, or lab accreditation status change, submit a QC plan supplement at least 3 business days before implementing the proposed change. Do not implement the change without authorization.

39-1.01C(4) Test Results
For mix design, JMF verification, production start-up, and each 10,000 tons, submit AASHTO T 283 and AASHTO T 324 (Modified) test results to the Engineer and electronically to:

Moisture_Tests@dot.ca.gov

Submit all QC test results, except AASHTO T 283 and AASHTO T 324 (Modified), within 3 business days of a request. Submit AASHTO T 283 QC tests within 15 days of sampling.

For tests performed under AASHTO T 324 (Modified), submit test data and 1 tested sample set within 5 business days of sampling.

If coarse and fine durability index tests are required, submit test results within 2 business days of testing.

If tapered notched wedge is used, submit test result values within 24 hours of testing.

39-1.01C(5) Reserved
39-1.01C(6) Liquid Antistrip Treatment
If liquid antistrip treatment is used, submit the following with your proposed JMF submittal:

1. One 1-pint sample
2. Infrared analysis including copy of absorption spectra
3. Certified copy of test results
4. Certificate of compliance for each liquid antistrip shipment. On each certificate of compliance, include:
   4.1. Your signature and printed name
   4.2. Shipment number
   4.3. Material type
   4.4. Material specific gravity
   4.5. Refinery
   4.6. Consignee
   4.7. Destination
   4.8. Quantity
   4.9. Contact or purchase order number
   4.10. Shipment date
6. Proposed proportions for liquid antistrip

For each delivery of liquid antistrip to the HMA production plant, submit a 1-pint sample to METS. Submit shipping documents. Label each liquid antistrip sampling container with:

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

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

1. For batch plant mixing:
   1.1. Production date
   1.2. Time of batch completion
   1.3. Mix size and type
   1.4. Each ingredient's weight
1.5. Asphalt binder content as a percentage of the total weight of mix
1.6. Liquid antistrip content as a percentage of the asphalt binder weight

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

39-1.01C(7) Lime Treatment
If aggregate lime treatment is used, submit the following with your proposed JMF submittal and each time you produce lime-treated aggregate:

1. Exact lime proportions for fine and coarse virgin aggregate
2. If marination is required, the averaged aggregate quality test results within 24 hours of sampling
3. For dry lime aggregate treatment, a treatment data log from the dry lime and aggregate proportioning device in the following order:
   3.1. Treatment date
   3.2. Time of day the data is captured
   3.3 Aggregate size being treated
   3.4. HMA type and mix aggregate size
   3.5. Wet aggregate flow rate collected directly from the aggregate weigh belt
   3.6. Aggregate moisture content, expressed as a percent of the dry aggregate weight
   3.7. Flow rate of dry aggregate calculated from the flow rate of wet aggregate
   3.8. Dry lime flow rate
   3.9. Lime ratio from the authorized JMF for each aggregate size being treated
   3.10. Lime ratio from the authorized JMF for the combined aggregate
   3.11. Actual lime ratio calculated from the aggregate weigh belt output, the aggregate moisture input, and the dry lime meter output, expressed as a percent of the dry aggregate weight
   3.12. Calculated difference between the authorized lime ratio and the actual lime ratio
4. For lime slurry aggregate treatment, a treatment data log from the slurry proportioning device in the following order:
   4.1. Treatment date
   4.2. Time of day the data is captured
   4.3. Aggregate size being treated
   4.4. Wet aggregate flow rate collected directly from the aggregate weigh belt
   4.5. Moisture content of the aggregate just before treatment, expressed as a percent of the dry aggregate weight
   4.6. Dry aggregate flow rate calculated from the wet aggregate flow rate
   4.7. Lime slurry flow rate measured by the slurry meter
   4.8. Dry lime flow rate calculated from the slurry meter output
   4.9. Authorized lime ratio for each aggregate size being treated
   4.10. Actual lime ratio calculated from the aggregate weigh belt and the slurry meter output, expressed as a percent of the dry aggregate weight
   4.11. Calculated difference between the authorized lime ratio and the actual lime ratio
   4.12. Dry lime and water proportions at the slurry treatment time

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

39-1.01C(8) Warm Mix Asphalt Technology
If a warm mix asphalt technology is used, submit the following with your proposed JMF submittal:

1. MSDS for warm mix asphalt technology

2. For warm mix asphalt water injection foam technology:
   2.1. Name of technology
   2.2. Proposed foaming water content
   2.3. Proposed HMA production temperature range
   2.4. Certification from binder supplier stating no antifoaming agent is used.

3. For warm mix asphalt additive technology:
   3.1. Name of technology
   3.2. Percent admixture by weight of binder and percent admixture by total weight of HMA as recommended by the manufacturer
   3.3. Methodology for inclusion of admixture in laboratory-produced HMA
   3.4. Proposed HMA production temperature range

Collect and hold data for the duration of the contract and submit the electronic media, daily and upon request. The snapshot of production data must include the following:

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

At the end of each day's production shift, submit electronic and printed media from the HMA plant process controller. Present data on electronic media in comma-separated values or tab-separated values format. The captured data for the ingredients represented by production snapshot must have allowances for sufficient fields to satisfy the amount of data required by these specifications and include data titles at least once per report.

39-1.01C(9) Samples
For the samples taken for JMF verification, submit 3 parts to the Engineer and use 1 part for your testing.

At production start-up and within 1000 tons of the halfway point of production of HMA, submit samples split from your HMA production sample for AASHTO T 283 and AASHTO T 324 (Modified) tests to the Engineer.

For production samples taken, submit 3 parts to the Engineer and use 1 part for your testing.

39-1.01C(10)–39-1.01C(11) Reserved

39-1.01C(12) Data Cores
Section 39-1.01C(12) applies if a bid item for data core is shown on the Bid Item List.

Submit a summary of data cores taken and a photograph of each data core to the Engineer and to:

Coring@dot.ca.gov

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

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

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

39-1.01C(13) Pavement Smoothness
39-1.01C(13)(a) General
Reserved

39-1.01C(13)(b) Straightedge Measurements
Within 2 business days of performing straightedge measurements, submit areas requiring smoothness correction. Identify locations of smoothness correction by:

1. Location Number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a lane:
   4.1. Lane direction as NB, SB, EB, or WB
   4.2. Lane number from left to right in direction of travel
   4.3. Wheel path as "L" for left, "R" for right, or "B" for both
5. For correction areas not within a lane:
   5.1. Identify pavement area (i.e., shoulder, weight station, turnout)
   5.2. Direction and distance from centerline as "L" for left or "R" for right
6. Estimated size of correction area

39-1.01C(13)(c) Inertial Profiler Certification
At least 5 business days before the start of initial profiling or changing profiler or operator, submit:

1. Inertial profiler certification issued by the Department.
2. Operator certification for the inertial profiler issued by the Department.
3. List of manufacturer's recommended test procedures for the inertial profiler calibration and verification.

Within 2 business days after cross-correlation testing, submit ProVAL profiler certification analysis report for cross-correlation test results performed on test section to the Engineer and to the electronic mailbox address:
smoothness@dot.ca.gov

39-1.01C(13)(d) Inertial Profiler Data

Within 2 business days after each day of inertial profiling, submit profile information to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

The profile information must include:

1. Raw profile data for each lane.
2. ProVAL ride quality analysis report for the International Roughness Index of left and right wheel paths of each lane. Submit this report in pdf file format.
3. ProVAL ride quality analysis report for the Mean Roughness Index of each lane. Submit this report in pdf file format.
4. ProVAL smoothness assurance analysis report for the International Roughness Index of left wheel path. Submit this report in pdf file format.
5. ProVAL smoothness assurance analysis report for the International Roughness Index of right wheel path. Submit this report in pdf file format.
6. ProVAL smoothness assurance analysis report for grinding locations of left wheel path. Submit this report in pdf file format.
7. ProVAL smoothness assurance analysis report for grinding locations of right wheel path. Submit this report in pdf file format.
8. GPS data file for each lane in GPS eXchange. Submit data file in GPS eXchange file format.
9. Manufacturer's recommended inertial profiler calibration and verification test results.
10. Inertial profiler calibration and verification test results including bounce, block, and distance measurement instrument.

Submit the raw profile data in unfiltered electronic pavement profile file (PPF) format. Name the PPF file using the following naming convention:

YYYYMMDD_TTCCRRR_D_L_W_B_E_X_PT.PPF

where:
YYYY = year
MM = Month, leading zero
DD = Day of month, leading zero
TT = District, leading zero
CCC = County, 2 or 3 letter abbreviation as shown in section 1-1.08
RRR = Route number, no leading zeros
D = Traffic direction as NB, SB, WB, or EB
L = Lane number from left to right in direction of travel
W = Wheel path as "L" for left, "R" for right, or "B" for both
B = Beginning station to the nearest foot (i.e., 10+20) or beginning post mile to the nearest hundredth (i.e., 25.06) no leading zero
E = Ending station to the nearest foot (i.e., 14+20) or ending post mile to the nearest hundredth (i.e., 28.06) no leading zero
X = Profile description as "EXIST" for existing pavement, "INTER" for after prepaving smoothness correction, "PAVE" for after paving, and "CORR" for after final surface pavement correction
PT = HMA pavement type

39-1.01C(13)(e) Reserved
39-1.01C(14)–39-1.01C(15) Reserved
39-1.01D Quality Control and Assurance
39-1.01D(1) General

When testing under AASHTO T 324 (Modified), test under AASHTO T 324 with the following parameters:
1. Target air voids must equal 7 ± 1 percent
2. Specimen height must be 60 ± 1 mm
3. Number of test specimens must be 4 (2 test sets)
4. Do not average test sets
5. Test specimen must be a 150 mm gyratory compacted specimen
6. Test temperature must be set at:
   6.1. 113 ± 2 degrees F for PG 58
   6.2. 122 ± 2 degrees F for PG 64
   6.3. 131 ± 2 degrees F for PG 70 and above
7. Measurements for impression must be taken at every 100 passes along the total length of sample
8. Inflection point defined as the number of wheel passes at the intersection of the creep slope and the stripping slope at maximum rut depth
9. Testing shut off must be set at 25,000 passes
10. Submersion time for samples must not exceed 4 hours

Take samples under California Test 125.

HMA samples may be heated a maximum of 2 times for up to 4 hours each.

39-1.01D(2) Job Mix Formula Verification

The Engineer verifies the JMF from samples taken from HMA produced by the plant to be used. The production set point at the plant must be within ±0.2 from the asphalt binder percentage target value shown in your Contractor Job Mix Formula Proposal form. Notify the Engineer at least 2 business days before sampling materials. Samples may be taken from a different project including a non-Department project if you make arrangements for the Engineer to be present during sampling.

In the Engineer's presence and from the same production run, take samples of:

1. Aggregate. Coarse, fine, and supplemental fine aggregate must be taken from the combined cold feed belt, or hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fines. For hot bin samples, the Department combines these aggregate samples to comply with the TV submitted on a Contractor Job Mix Formula Proposal form.
2. Asphalt binder. Take 2 samples minimum. Each sample must be in a 1-quart cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. RAP samples must be at least 50 lb from each fractionated stockpile used or 100 lb from the belt.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Three parts are for the Department's verification testing and 1 part is for your testing.

After acceptance of the JMF submittal, the Engineer verifies each proposed JMF within 20 days of receiving all verification samples.

For JMF verification, the Engineer tests the following for compliance with the specifications:

1. Aggregate quality
2. Aggregate gradation
3. Voids in mineral aggregate on laboratory-produced HMA must comply with the mix design specifications for voids in mineral aggregate
4. HMA quality characteristics for Department acceptance

To verify the HMA for air voids, voids in mineral aggregate, and dust proportion, the Engineer uses an average of 3 briquettes. The Engineer tests plant-produced material.

If the Engineer verifies the JMF, the Engineer furnishes you a Hot Mix Asphalt Verification form.
If the Engineer's test results on plant-produced samples do not show compliance with the specifications, the Engineer notifies you. Adjust your JMF based on your testing unless the Engineer authorizes reverification without adjustments. JMF adjustments may include a change in:

1. Asphalt binder content target value up to ±0.2 percent from the OBC value submitted on Contractor Hot Mix Asphalt Design Data form
2. Aggregate gradation target values within the target value limits specified in the aggregate gradation table

You may adjust the JMF only once due to a failed verification test.

For each HMA type and aggregate size specified, the Engineer verifies up to 2 proposed JMF submittals including a JMF adjusted after verification failure. If you submit more than 2 JMFs for each type of HMA and aggregate size, the Engineer deducts $3,000 from payments for each verification exceeding this limit. This deduction does not apply to verifications initiated by the Engineer or if a JMF expires while HMA production is stopped longer than 30 days.

A verified JMF is valid for 12 months.

39-1.01D(3) Job Mix Formula Authorization
You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications
2. The Department has verified the JMF within 12 months before HMA production
3. The Engineer authorizes the verified JMF

39-1.01D(4) Job Mix Formula Renewal
For a JMF renewal and upon request, in the Engineer's presence and from the same production run, take samples of:

1. Aggregate. Coarse, fine, and supplemental fine aggregate must be taken from combined cold-feed belt, or hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fines. For hot bins, the Department combines these aggregate samples to comply with the TV submitted on a Contractor Job Mix Formula Proposal form.
2. Asphalt binder. Take 2 samples minimum. Each sample must be in a 1-quart cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. RAP samples must be at least 50 lb from each fractionated stockpile.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

Notify the Engineer at least 2 business days before sampling materials. For aggregate, RAP, and HMA, split samples into at least 4 parts. Submit 3 parts to the Engineer and use 1 part for your testing.

Allow the Engineer 5 business days from a complete JMF reverification submittal for document review of the aggregate qualities, mix design, and JMF.

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or upon request, the Engineer may perform aggregate quality tests for verification of JMF renewal.

The Engineer verifies the JMF for renewal under section 39-1.01D(2) except:

1. The Engineer keeps the samples until you provide test results for your part on a Contractor Job Mix Formula Renewal form.
2. The Department tests samples of materials obtained from the HMA production unit after you submit test results that comply with the mix design specifications.
3. After completion of the JMF verification renewal document review, the Engineer verifies each proposed JMF within 20 days of receiving the verification renewal samples and the complete Contractor Job Mix Formula Renewal form.
4. You may not adjust the JMF due to a failed verification.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at no cost to you 1 proposed JMF renewal within a 12-month period.
If the Engineer verifies the JMF renewal, the Engineer furnishes you a Hot Mix Asphalt Verification form. The Hot Mix Asphalt Verification form is valid for 12 months.

**39-1.01D(5) Job Mix Formula Modification**

The Engineer verifies the modified JMF after the modified JMF HMA is placed on the project and verification samples are taken within the first 750 tons. The Engineer tests verification samples for compliance with:

1. Hamburg wheel track mix design specifications
2. Air void content
3. Voids in mineral aggregate on plant-produced HMA mix design specifications
4. Dust proportion mix design specifications

The Engineer may test for moisture susceptibility for compliance with the mix design specifications.

If the modified JMF is verified, the Engineer revises your Hot Mix Asphalt Verification form to include the new asphalt binder source, new liquid antistrip producer, or new liquid antistrip dosage. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected. The Engineer deducts $2,000 from payments for each JMF modification.

**39-1.01D(6) Certifications**

**39-1.01D(6)(a) General**

Laboratories testing aggregate and HMA qualities used to prepare the mix design and JMF must be qualified under AASHTO Materials Reference Laboratory program and the Department’s Independent Assurance Program.

**39-1.01D(6)(b) Hot Mix Asphalt Plants**

Before production, the HMA plant must have a current qualification under the Department’s Material Plant Quality Program.

**39-1.01D(6)(c) Inertial Profiler Certifications**

The inertial profiler equipment must display a current certification decal with expiration date.

The inertial profiler operator and device certifications must be not more than 12 months old.

The operator must be certified for each different model of inertial profiler device operated.

**39-1.01D(6)(d)–39-1.01D(6)(e) Reserved**

**39-1.01D(7) Preparing Meeting**

Meet with the Engineer at a preparing meeting at a mutually agreed time and place. Discuss the QC plan and the methods of performing HMA production and paving work.

The following personnel must attend the preparing meeting:

1. Project manager
2. Superintendent
3. HMA plant manager
4. HMA paving foreman

If a warm mix asphalt technology is used, a technical representative for warm mix asphalt technology must attend the preparing meeting.

**39-1.01D(8) Quality Control**

**39-1.01D(8)(a) General**

QC test results must comply with the specifications for Department acceptance.

Prepare 3 briquettes for air voids content and voids in mineral aggregate determination. Report the average of 3 tests.

Except for smoothness, if 2 consecutive QC test results or any 3 QC test results for 1 day’s production do not comply with the materials specifications:
1. Stop HMA production
2. Notify the Engineer
3. Take corrective action
4. Demonstrate compliance with the specifications before resuming production and placement

For QC tests performed under AASHTO T 27, results are considered 1 QC test regardless of number of sieves out of compliance.

Do not resume production and placement until the Engineer authorizes your corrective action proposal.

39-1.01D(8)(b)  Reserved
39-1.01D(8)(c)  Aggregate
39-1.01D(8)(c)(i)  General
Reserved
39-1.01D(8)(c)(ii)  Aggregate Lime Treatments
If lime treatment is required, sample coarse and fine aggregate from individual stockpiles before lime treatment. Combine aggregate in the JMF proportions. Test the aggregate under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Quality Control During Lime Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality characteristic</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>Sand equivalent(^a, b)</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
</tr>
<tr>
<td>Los Angeles Rattler</td>
</tr>
<tr>
<td>Fine aggregate angularity</td>
</tr>
<tr>
<td>Flat and elongated particles</td>
</tr>
</tbody>
</table>

\(^a\)Report test results as the average of 3 tests from a single sample.
\(^b\)Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, and 8.4.3 do not apply.

For lime slurry aggregate treatment, determine the aggregate moisture content at least once every 2 hours of treatment. Calculate moisture content under AASHTO T 329 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

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

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

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

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

The Engineer may order you to stop aggregate treatment activities for any of following:
1. You fail to submit treatment data log
2. You fail to submit aggregate QC data for marinated aggregate
3. You submit incomplete, untimely, or incorrectly formatted data
4. You do not take corrective actions
5. You take late or unsuccessful corrective actions
6. You do not stop treatment when proportioning tolerances are exceeded
7. You use malfunctioning or failed proportioning devices

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

39-1.01D(8)(d) Liquid Antistrip Treatment
For continuous mixing or batch-plant mixing, sample asphalt binder before adding liquid antistrip. For continuous mixing, sample the combined asphalt binder and liquid antistrip after the static mixer.

39-1.01D(8)(e) Production Start-up Evaluation
You and the Engineer evaluate HMA production and placement at production start-up.
Within the first 750 tons produced on the 1st day of HMA production, in the Engineer's presence, and from the same production run, take samples of:
1. Aggregate
2. Asphalt binder
3. RAP
4. HMA

Sample aggregate from the combined cold-feed belt or hot bin. Take RAP samples from the RAP system.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 parts to the Engineer and keep 1 part.

You and the Engineer must test the samples and report test results, except for AASHTO T 324 (Modified) and AASHTO T 283 test results, within 5 business days of sampling. For AASHTO T 324 (Modified) and AASHTO T 283 test results, report test results within 15 days of sampling. If you proceed before receipt of the test results, the Engineer may consider the HMA placed to be represented by these test results.

Take one 4- or 6-inch diameter density core for each 250 tons or portion thereof of HMA placed. For each density core, the Engineer reports the bulk specific gravity determined under AASHTO T 275, Method A, in addition to the percent of theoretical maximum density.

39-1.01D(8)(f) Hot Mix Asphalt Density
During HMA placement determine HMA density using a nuclear gauge. On the 1st day of production, develop a correlation factor between cores and nuclear gauge under California Test 375.

Test for in-place density using cores and a nuclear gauge. Test at random locations you select and include the test results in your QC production tests reports.

39-1.01D(8)(g) Tapered Notched Wedge
Perform QC testing on the completed tapered notched wedge joint as follows:
1. Perform field compaction tests at the rate of 1 test for each 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform field compaction tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.
3. Determine theoretical maximum density.
4. Determine percent compaction of the longitudinal joint as the ratio of the daily average of the field compaction values and the maximum density test results.

Determine percent compaction values each day the tapered notched wedge joint is completed. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process in order to comply with the specifications.
39-1.01D(8)(h) Density Cores
To determine density, take 4- or 6-inch diameter density cores at least once every 5 business days. Take 1 density core for every 250 tons of HMA from random locations the Engineer designates. Take density cores in the Engineer's presence and backfill and compact holes with authorized material. Before submitting a density core, mark it with the density core's location and place it in a protective container.

If a density core is damaged, replace it with a density core taken within 1 foot longitudinally from the original density core. Relocate any density core located within 1 foot of a rumble strip to 1 foot transversely away from the rumble strip.

For a tapered notched wedge joint, take 4- or 6-inch diameter density cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations designated by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Cores must be taken in the presence of the Engineer and backfill and compact holes with authorized material. Before submitting a density core, mark it with the core's location and place it in a protective container.

39-1.01D(8)(i) Reserved
39-1.01D(8)(j) Pavement Smoothness
39-1.01D(8)(j)(i) General
Test pavement smoothness using an inertial profiler except use a 12-foot straightedge for the HMA pavement at the following locations:

1. Traffic lanes less than 1,000 feet in length including ramps, turn lanes, and acceleration and deceleration lanes
2. HMA pavement within 3 feet from and parallel to the construction joint formed between curbs, gutters, or existing pavement
3. Areas within 15 feet of manholes
4. Shoulders
5. Weigh-in-motion areas
6. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

Where inertial profiler testing is required, pavement smoothness for each lane must be determined by the International Roughness Index for the left and right wheel paths in an individual lane and then averaging the results. The average of the International Roughness Index values from the left and right wheel paths for the same lane is the Mean Roughness Index of the lane. The wheel paths are a pair of lines 3 feet from and parallel to the edge of a lane. Left and right wheel paths are based on the direction of travel.

Where inertial profiler testing is required, identify areas of localized roughness. Areas of localized roughness must be identified using the FHWA's engineering software ProVAL smoothness assurance analysis by calculating continuous International Roughness Index values for each wheel path with a 25-foot interval using a 250 mm filter.

Collect profiling data under AASHTO R 56 and analyze data using 250 mm and International Roughness Index filters.

39-1.01D(8)(j)(ii) Inertial Profiler Calibration and Verification Tests
Operate the inertial profiler according to the manufacturer's instructions and AASHTO R 57 at 1-inch recording intervals.

Notify the Engineer 2 business days before performing inertial profiler calibration and verification testing.

Conduct the following inertial profiler calibration and verification tests in the Engineer's presence each day before performing inertial profiling:

1. Block test. Verify the height sensor accuracy under California Test 387.
2. Bounce test. Verify the combined height sensor and accelerometer accuracy under California Test 387.
3. Distance measurement instrument test. Calibrate the accuracy of the testing procedure under California Test 387.
4. Manufacturer's recommended tests.
Conduct cross-correlation inertial profiler verification test in the Engineer's presence before performing initial profiling. Verify cross-correlation inertial profiler verification test at least annually. Conduct 5 repeat runs of the inertial profiler on an authorized test section. The test section must be on an existing asphalt concrete pavement surface 0.1 mile long. Calculate a cross-correlation to determine the repeatability of your device under California Test 387 using ProVAL profiler certification analysis with a 3 feet maximum offset. The cross-correlation must be a minimum of 0.92.

For each 0.1 mile section, your International Roughness Index values must be within 10 percent of the Department's International Roughness Index values. The Engineer may order you to recalibrate your inertial profiler equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your inertial profiler operator.

**39-1.01D(8)(j)(iii) Smoothness Testing**

Notify the Engineer of start location by station and start time at least 2 business days before profiling.

Remove foreign objects on the pavement surface before profiling.

Mark the beginning and ending station on the pavement shoulder before profiling. Stationing must be the same when profiling more than one surface.

While collecting the profile data to determine the International Roughness Index values, record the following locations in the raw profile data:

1. Begin and end of all bridge approach slabs
2. Begin and end of all bridges
3. Begin and end of all culverts visible on the roadway surface
4. Begin and end of all at-grade intersections

Determine the Mean Roughness Index for 0.1-mile fixed sections using the ProVAL ride quality analysis with a 250 mm filter. Profile the left and right wheel paths of each lane. Calculate the Mean Roughness Index of each lane. A partial section less than 0.1 mile that is the result of an interruption to continuous pavement surface must comply with the Mean Roughness Index specifications for a full section. Adjust the Mean Roughness Index for a partial section to reflect a full section based on the proportion of a section paved.

Determine the areas of localized roughness using a continuous International Roughness Index for each wheel path with a 25-foot interval using a 250 mm filter.

Pavement smoothness must comply with the specifications in section 39-1.01D(9)(c).

**39-1.01D(9) Department Acceptance**

**39-1.01D(9)(a) General**

The Department tests treated aggregate for acceptance before lime treatment except for gradation.

The Engineer takes HMA samples for AASHTO T 283 and AASHTO T 324 (Modified) from one of the following:

1. At the plant
2. At the truck
3. Windrow

The Engineer takes HMA samples for all other tests from one of the following:

1. At the plant
2. At the truck
3. Windrow
4. Mat behind the paver

The Engineer's sampling and testing is independent of your QC sampling and testing.
If you request, the Engineer splits samples and provides you with a part.

No single test result may represent more than 750 tons or one day's production, whichever is less, excluding AASHTO T 283 and AASHTO T 324 (Modified).

Except for smoothness, if 2 consecutive Department acceptance test results or any 3 Department acceptance test results for 1 day's production do not comply with the specifications:

1. Stop HMA production
2. Take corrective action
3. Demonstrate compliance with the specifications before resuming production and placement

For Department acceptance tests performed under AASHTO T 27, results are considered 1 Department acceptance test regardless of the number of sieves out of compliance.

The Engineer accepts HMA based on:

1. Authorized JMF
2. Authorized QC plan
3. Asphalt binder compliance
4. Asphalt emulsion compliance
5. Visual inspection
6. Pavement smoothness

39-1.01D(9)(b) In-Place Density

Except for HMA pavement placed using method compaction, the Engineer tests the density core you take from each 250 tons of HMA. The Engineer determines the percent of theoretical maximum density for each density core by determining the density core's density and dividing by the theoretical maximum density.

Density cores must be taken from the final layer, cored to the specified total paved thickness.

If the percent of theoretical maximum density does not comply with the specifications, the Engineer may accept the HMA and take a payment deduction.

For acceptance of a completed tapered notched wedge joint, the Engineer determines density from cores based on:

1. Field compaction by measuring the bulk specific gravity of the cores under AASHTO T 275, Method A
2. Percent compaction as the ratio of the average of the bulk specific gravity of the core for each day's production to the maximum density test value

39-1.01D(9)(c) Pavement Smoothness

For areas that require pavement smoothness determined using an inertial profiler, the pavement surface must:

1. Have no areas of localized roughness with an International Roughness Index greater than 160 in/mi
2. Comply with the Mean Roughness Index requirements shown in the following table for a 0.1 mile section:

<table>
<thead>
<tr>
<th>HMA thickness</th>
<th>Mean Roughness Index requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 0.20 foot</td>
<td>60 in/mi or less</td>
</tr>
<tr>
<td>≤ 0.20 foot</td>
<td>75 in/mi or less</td>
</tr>
</tbody>
</table>

*a Except OGFC
The final surface of HMA must comply with the Mean Roughness Index requirements before placing OGFC. Correct pavement to the Mean Roughness Index specifications. Localized roughness greater than 160 in/mi must be corrected regardless of the International Roughness Index values of a 0.1-mile section.

For areas that require pavement smoothness determined using a 12-foot straightedge, the HMA pavement surface must not vary from the lower edge of the straightedge by more than:

1. 0.01 foot when the straightedge is laid parallel with the centerline
2. 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
3. 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

Pavement smoothness may be accepted based on your testing in the absence of the Department's testing.

39-1.01D(9)(d) Dispute Resolution

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 a test result if you dispute the test result.

If you or the Engineer dispute each other's test results, submit QC test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the 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 on 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 HMA producer

If split QC or acceptance samples are not available, the independent third party uses any available material representing the disputed HMA for evaluation.

If the independent third party determines the Department's test results are valid, the Engineer deducts the independent third party's testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party's testing costs.

39-1.02 MATERIALS

39-1.02A General

Reserved

39-1.02B Mix Design

39-1.02B(1) General

The HMA mix design must comply with AASHTO R 35 except:

1. Notes 3, 6, and 10 do not apply
2. AASHTO M 323 does not apply on combinations of aggregate gradation and asphalt binder contents to determine the OBC and HMA mixture qualities

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

39-1.02B(2) Hot Mix Asphalt Treatments

If the test results for AASHTO T 283 or AASHTO T 324 (Modified) for untreated plant-produced HMA are less than the minimum requirements for HMA mix design, determine the plasticity index of the aggregate blend under California Test 204.

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

If the plasticity index is from 4 to 10, treat the aggregate with dry lime with marination or lime slurry with marination.
If the plasticity index is less than 4, treat the aggregate with dry lime or lime slurry with marination, or treat the HMA with liquid antistrip.

39-1.02B(3) Warm Mix Asphalt Technology
For HMA with warm mix asphalt additive technology, produce HMA mix samples for your mix design using your methodology for inclusion of warm mix asphalt admixture in laboratory-produced HMA. For warm mix asphalt water injection foam technology, the use of foamed asphalt for mix design is not required.

39-1.02C Asphalt Binder
Asphalt binder must comply with section 92.

For replace asphalt concrete surfacing or hot mix asphalt (leveling) the grade of asphalt binder for the HMA must be PG 64-10 or PG 64-16.

39-1.02D Aggregate
39-1.02D(1) General
Aggregate must be clean and free from deleterious substances.

The aggregate for replace asphalt concrete surfacing and hot mix asphalt (leveling) must comply with the gradation specifications for Type A HMA in section 39-2.02.

39-1.02D(2) Aggregate Gradations
Aggregate gradation must be determined before the addition of asphalt binder and must include supplemental fines. Test for aggregate gradation under AASHTO T 27. Do not wash the coarse aggregate. Use a mechanical sieve shaker. Aggregate shaking time must not exceed 10 minutes for each coarse and fine aggregate portion.

Choose a target value within the target value limits shown in the tables titled "Aggregate Gradations."
Gradations are based on nominal maximum aggregate size.

39-1.02D(3) Aggregate Lime Treatments
39-1.02D(3)(a) General
If aggregate lime treatment is required, virgin aggregate must comply with the aggregate quality specifications.

Lime for treating aggregate must comply with section 24-2.02B.

Water for lime treatment of aggregate with lime slurry must comply with section 24-2.02C.

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

Do not treat RAP.

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

Coarse and fine aggregate fractions must have the lime ratio ranges shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate fractions</th>
<th>Lime ratio percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>0.4–1.0</td>
</tr>
<tr>
<td>Fine</td>
<td>1.5–2.0</td>
</tr>
<tr>
<td>Combined</td>
<td>0.8–1.5</td>
</tr>
</tbody>
</table>

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

If marination is required, marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.
Treated aggregate must not have lime balls or clods.

39-1.02D(3)(b) Dry Lime
If marination is required:
1. Treat and marinate coarse and fine aggregates separately
2. Treat the aggregate and stockpile for marination only once
3. Treat the aggregate separate from HMA production

Proportion dry lime by weight with an automatic continuous proportioning system.

If you use a batch-type proportioning system for HMA production, control proportioning in compliance with the specifications for continuous mixing plants. Use a separate dry lime aggregate treatment system for HMA batch mixing including:
1. Pugmill mixer
2. Controller
3. Weigh belt for the lime
4. Weigh belt for the aggregate

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

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

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

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

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

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

39-1.02D(3)(c) Lime Slurry
For lime slurry aggregate treatment, treat aggregate separate from HMA production. Stockpile and marinate the aggregate.

Proportion lime and water with a continuous or batch mixing system.

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

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

Proportion lime slurry and aggregate by weight in a continuous process.

39-1.02E Liquid Antistrip Treatment
Liquid antistrip must be from 0.25 to 1.0 percent by weight of asphalt binder. Do not use liquid antistrip as a substitute for asphalt binder.
Liquid antistrip total amine value must be 325 minimum when tested under ASTM D2074.

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

Store and mix liquid antistrip under the manufacturer's instructions.

39-1.02F–39-1.02G Reserved
39-1.02H Hot Mix Asphalt Production
39-1.02H(1) General
Do not start HMA production before verification and authorization of JMF.

HMA plants must be Department-qualified. Before production, the HMA plant must have a current qualification under the Department's Materials Plant Quality Program.

For lime treated aggregate, the HMA plant must be equipped with a bag-house dust system. Material collected in the dust system must be returned to the mix.

Weighing and metering devices used for the production of HMA modified with additives must comply with the requirements of the Department's Material Plant Quality Program. If a loss-in-weight meter is used for dry HMA additive, the meter must have an automatic and integral material delivery control system for the refill cycle.

Calibrate the loss-in-weight meter by:

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

Proportion aggregate by hot or cold-feed control.

Aggregate temperature must not be more than 375 degrees F when mixed with the asphalt binder.

Asphalt binder temperature must be from 275 to 375 degrees F when mixed with aggregate.

Mix HMA ingredients into a homogeneous mixture of coated aggregates.

HMA with or without RAP must not be more than 325 degrees F.

For HMA produced using warm mix asphalt technology, HMA must be at a temperature between 240 and 325 degrees F.

If method compaction is used, HMA must be produced at a temperature between 305 and 325 degrees F.

If you stop production for longer than 30 days, a production start-up evaluation is required.

39-1.02H(2) Liquid Antistrip

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

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

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

The Engineer orders proportioning activities stopped for any of the following:

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

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

39-1.02H(3) Warm Mix Asphalt Technology

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

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

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

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

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

1. Metered HMA additive must be placed in an intermediate holding vessel before being added to the stream of asphalt binder as it enters the pugmill.
2. If a container scale is used, weigh additive before combining with asphalt binder. Keep the container scale separate from other ingredient proportioning. The container scale capacity must be no more than twice the volume of the maximum additive batch size. The container scale's graduations must be smaller than the proportioning tolerance or 0.001 times the container scale capacity.
3. Dry HMA additive proportioning devices must be separate from metering devices for the aggregates and asphalt binder. Proportion dry HMA additive directly into the pugmill or place in an intermediate holding vessel to be added to the pugmill at the appropriate time in the batch cycle. Dry ingredients for batch production must be proportioned with a hopper scale.
4. Zero tolerance for the HMA additive batch scale is ±0.5 percent of the target additive weight. The indicated HMA additive batch scale weight may vary from the preselected weight setting by up to ±1.0 percent of the target additive weight.

39-1.02I Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer must comply with the specifications for pavement fabric, paving mat, paving grid, paving geocomposite grid, or geocomposite strip membrane as shown.

The asphalt binder for geosynthetic pavement interlayer must be PG 64-10, PG 64-16, or PG 70-10.

39-1.02J Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalt binder. Choose the type and grade.
39-1.02K Miscellaneous Areas and Dikes
For miscellaneous areas and dikes:

1. Choose either the 3/8-inch or 1/2-inch aggregate gradation for Type A HMA.
2. Minimum asphalt binder content must be 6.8 percent for 3/8-inch aggregate and 6.0 percent for 1/2-inch aggregate. If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content.
3. Choose asphalt binder Grade PG 64-10, PG 64-16 or PG 70-10.

For HMA used in miscellaneous areas and dikes, sections 39-1.01C, 39-1.01D, 39-1.02B, 39-1.02D(3), and 39-1.02E–J do not apply.

39-1.03 CONSTRUCTION
39-1.03A General
Do not place HMA on wet pavement or frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

HMA placed in a windrow on the roadway surface must not extend more than 250 feet in front of the loading equipment or material transfer vehicle.

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

Where density or data core samples are taken, backfill and compact holes with authorized material.

Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 130 degrees F for HMA with warm mix asphalt technology

39-1.03B Spreading and Compacting Equipment
39-1.03B(1) General
Paving equipment for spreading must be:

1. Self-propelled
2. Mechanical
3. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane
4. Equipped with a full-width compacting device
5. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope
Install and maintain grade and slope references.

The screed must be heated and produce a uniform HMA surface texture without tearing, shoving, or gouging.

The paver must not leave marks such as ridges and indentations unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

In areas inaccessible to spreading and compacting equipment:

1. Spread the HMA by any means to obtain the specified lines, grades, and cross sections
2. Use a pneumatic tamper, plate compactor, or equivalent to achieve thorough compaction

39-1.03B(2) Material Transfer Vehicle
If a material transfer vehicle is specified, the material transfer vehicle must have sufficient capacity to prevent stopping the paver and must be capable of:

1. Either receiving HMA directly from trucks or using a windrow pickup head to load it from a windrow deposited on the roadway surface
2. Remucking the HMA with augers before transferring into the paver's receiving hopper or feed system
3. Transferring HMA directly into the paver's receiving hopper or feed system

39-1.03B(3) Method Compaction Equipment
For method compaction, each paver spreading HMA must be followed by 3 rollers:

1. One vibratory roller specifically designed to compact HMA. The roller must be capable of at least 2,500 vibrations per minute and must be equipped with amplitude and frequency controls. The roller’s gross static weight must be at least 7.5 tons.
2. One oscillating type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi.
3. One steel-tired, 2-axle tandem roller. The roller’s gross static weight must be at least 7.5 tons.

Each roller must have a separate operator. Rollers must be self-propelled and reversible.

39-1.03B(4)–39-1.03B(6) Reserved
39-1.03C Surface Preparation
39-1.03C(1) General
Before placing HMA, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping.

39-1.03C(2) Subgrade
Prepare subgrade to receive HMA under the sections for the material involved. Subgrade must be free of loose and extraneous material.

39-1.03C(3) Reserved
39-1.03C(4) Preparing Inertial Profiler
Section 39-1.03C(4) applies to existing asphalt concrete surfaces receiving an HMA overlay if a bid item for preparing inertial profiler is shown in the Bid Item List.

Before starting paving activities, perform preparing inertial profiler measurements. Preparing inertial profiler includes taking profiles of the existing pavement, analyzing the data with ProVAL to determine existing pavement International Roughness Index, Mean Roughness Index, and areas of localized roughness.

If the Contract includes cold planing, perform preparing inertial profiler measurements before cold planing.

If the Contract includes replace asphalt concrete surfacing, perform preparing inertial profiler measurements after replacing the asphalt concrete surfacing.
39-1.03C(5)  Preparing Grinding

Section 39-1.03C(5) applies to all existing asphalt concrete surfaces that will not be cold planned or milled and that will receive an HMA overlay less than or equal to 0.20 foot exclusive of OGFC if a bid item for preparing grinding day is shown in the Bid Item List.

After performing preparing inertial profiling, correct areas of localized roughness greater than 180 in/mi.

Preparing grinding day includes correcting areas of localized roughness, taking profiles of the corrected areas, and submitting profile data as specified in section 39-1.01C(13)(d).

Notify the Engineer of those areas of localized roughness that cannot be corrected by preparing grinding according to the ProVAL smoothness assurance analysis grinding report. The Engineer responds to your notification within 5 business days.

For those areas of localized roughness that cannot be corrected by grinding, the Engineer may order you to either (1) not correct the areas of localized roughness or (2) correct areas of localized roughness by a different method and take profiles of the corrected areas with an inertial profiler. Corrective work performed by a different method, including taking profiles of the corrected areas and associated traffic control, is change order work.

If ordered not to correct areas of localized roughness, the smoothness specifications do not apply to the final pavement surface placed in those areas.

Correct preparing areas of localized roughness that you predict will cause the final surface of HMA pavement to be noncompliant with the smoothness specifications. After correcting preparing areas of localized roughness, take profiles of the corrected area and submit profile data as specified in section 39-1.01C(13)(d).

Dispose of grinding residue.

Pave within 7 days of correcting areas.

The final pavement surface must comply with section 39-1.01D(9)(c).

If the Engineer determines more time is required for preparing grinding than the Contract allows for and if preparing grinding is a controlling activity, the Engineer makes a time adjustment.

39-1.03C(6)  Tack Coat

Apply tack coat:

1. To existing pavement including planed surfaces
2. Between HMA layers
3. To vertical surfaces of:
   3.1. Curbs
   3.2. Gutters
   3.3. Construction joints

Before placing HMA, apply tack coat in 1 application at the minimum residual rate shown in the following table for the condition of the underlying surface:

<table>
<thead>
<tr>
<th>HMA over:</th>
<th>Minimum Residual Rates (gal/sq yd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h</td>
</tr>
<tr>
<td>New HMA (between layers)</td>
<td>0.02</td>
</tr>
<tr>
<td>PCC and existing AC surfacing</td>
<td>0.03</td>
</tr>
<tr>
<td>Planed pavement</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume under section 9-1.02 or you may use water meters from water districts, cities, or counties. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

1. Weight ratio of water to bituminous material in the original asphaltic emulsion
2. Weight of asphaltic emulsion before diluting
3. Weight of added water
4. Final dilution weight ratio of water to asphaltic emulsion

Apply to vertical surfaces with a residual tack coat rate that will thoroughly coat the vertical face without running off.

If you request and the Engineer authorizes, you may:

1. Change tack coat rates
2. Omit tack coat between layers of new HMA during the same work shift if:
   2.1. No dust, dirt, or extraneous material is present
   2.2. Surface is at least 140 degrees F

Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed.

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

Asphalt binder tack coat temperature must be from 285 to 350 degrees F when applied.

39-1.03C(7) Geosynthetic Pavement Interlayer

If specified, place geosynthetic pavement interlayer over a coat of asphalt binder. Place geosynthetic pavement interlayer in compliance with the manufacturer's instructions.

Before placing the geosynthetic pavement interlayer and asphalt binder:

1. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. Repairing cracks is change order work.
2. Clean the pavement of loose and extraneous material.

Immediately before placing the interlayer, apply 0.25 ± 0.03 gallon of asphalt binder per square yard of interlayer or until the fabric is saturated. Apply asphalt binder the width of the geosynthetic pavement interlayer plus 3 inches on each side. At an interlayer overlap, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

Align and place the interlayer with no overlapping wrinkles, except a wrinkle that overlaps may remain if it is less than 1/2 inch thick. If the overlapping wrinkle is more than 1/2 inch thick, cut the wrinkle out and overlap the interlayer no more than 2 inches.

The minimum HMA thickness over the interlayer must be 0.12 foot thick including conform tapers. Do not place the interlayer on a wet or frozen surface.

Overlap the interlayer borders between 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

Before placing HMA on the interlayer, do not expose the interlayer to:

1. Traffic except for crossings under traffic control and only after you place a small HMA quantity
2. Sharp turns from construction equipment
3. Damaging elements

Pave HMA on the interlayer during the same work shift.

**39-1.03D Longitudinal Joints**

**39-1.03D(1) General**

Longitudinal joints in the top layer must match lane lines. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the lane line. You may request other longitudinal joint placement patterns.

A vertical longitudinal joint of more than 0.15 foot is not allowed at any time between adjacent lanes open to traffic.

For HMA thickness of 0.15 foot or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For HMA thickness greater than 0.15 foot, you must place HMA on adjacent traveled way lanes or shoulder so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place kraft paper or other authorized release agent under the conform tapers to facilitate the taper removal when paving activities resume.

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

**39-1.03D(2) Tapered Notched Wedge**

For divided highways with an HMA lift thickness greater than 0.15 foot, you may construct a 1-foot wide tapered notched wedge joint as a longitudinal joint between adjacent lanes open to traffic. A vertical notch of 0.75 inch maximum must be placed at the top and bottom of the tapered wedge.

The tapered notched wedge must retain its shape while exposed to traffic. Pave the adjacent lane within 1 day.

Construct the tapered portion of the tapered notched wedge with an authorized strike-off device. The strike-off device must provide a uniform slope and must not restrict the main screed of the paver.

You may use a device attached to the screed to construct longitudinal joints that will form a tapered notched wedge in a single pass. The tapered notched wedge must be compacted to a minimum of 91 percent compaction.

**39-1.03E Edge Treatments**

Construct edge treatment on the HMA pavement as shown.

Where a safety edge is required, use the same type of HMA used for the adjacent lane or shoulder.

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

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

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

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

If paving is done in multiple lifts, the safety edge treatment must be placed with each lift.

Short sections of hand work are allowed to construct transitions for safety edge treatment.
39-1.03F Widening Existing Pavement
If widening existing pavement, construct new pavement structure to match the elevation of the existing pavement's edge before placing HMA over the existing pavement.

39-1.03G Shoulders, Medians, and Other Road Connections
Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

If shoulders or median borders are shown, pave shoulders and median borders adjacent to the lane before opening a lane to traffic.

If shoulder conform tapers are shown, place conform tapers concurrently with the adjacent lane's paving.

If a driveway or a road connection is shown, place additional HMA along the pavement's edge to conform to road connections and driveways. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

39-1.03H Leveling
Section 39-1.03H applies if a bid item for hot mix asphalt (leveling) is shown on the Bid Item List.

Fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as hot mix asphalt (leveling).

39-1.03I Miscellaneous Areas and Dikes
Prepare the area to receive HMA for miscellaneous areas and dikes, including excavation and backfill as needed.

Spread miscellaneous areas in 1 layer and compact to the specified lines and grades.

In median areas adjacent to slotted median drains, each layer of HMA must not exceed 0.20 foot maximum compacted thickness.

The finished surface must be:

1. Textured uniformly
2. Compacted firmly
3. Without depressions, humps, and irregularities

39-1.03J Replace Asphalt Concrete Surfacing
Where replace asphalt concrete surfacing is shown, remove existing asphalt concrete surfacing and replace with HMA. The Engineer determines the exact limits of asphalt concrete surfacing to be replaced.

Replace asphalt concrete in a lane before the lane is specified to be opened to traffic.

Before removing asphalt concrete, outline the replacement area and cut neat lines with a saw or grind to full depth of the existing asphalt concrete. Do not damage asphalt concrete and base remaining in place.
If the base is excavated beyond the specified plane, replace it with HMA. The Department does not pay for this HMA.

Do not use a material transfer vehicle if replace asphalt concrete surfacing is specified.

39-1.03K–39-1.03N Reserved
39-1.03O Compaction
39-1.03O(1) General
Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving.

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not open new HMA pavement to traffic until the surface temperature is below 130 degrees F.

If the surface to be paved is both in sunlight and shade, pavement surface temperatures are taken in the shade.

39-1.03O(2) Method Compaction
Use method compaction for any of the following conditions:

1. HMA pavement thickness shown is less than 0.15 foot
2. Replace asphalt concrete surfacing
3. Leveling courses
4. Areas the Engineer determines conventional compaction and compaction measurement methods are impeded

HMA compaction coverage is the number of passes needed to cover the paving width. A pass is 1 roller’s movement parallel to the paving in either direction. Overlapping passes are part of the coverage being made and are not a subsequent coverage. Do not start a coverage until completing the prior coverage.

Method compaction must consist of performing:

1. Breakdown compaction of each layer with 3 coverages using a vibratory roller. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the HMA layer thickness is less than 0.08 foot, turn the vibrator off.
2. Intermediate compaction of each layer of HMA with 3 coverages using a pneumatic-tired roller at a speed not to exceed 5 mph.
3. Finish compaction of HMA with 1 coverage using a steel-tired roller.

Start rolling at the lower edge and progress toward the highest part.

The Engineer may order fewer coverages if the layer thickness of HMA is less than 0.15 foot.

39-1.03O(3)–39-1.03O(5) Reserved
39-1.03P Smoothness Corrections
If the final surface of the pavement does not comply with the smoothness specifications, grind the pavement to within specified tolerances, remove and replace it, or place an overlay of HMA. Do not start corrective work until your method is authorized.

Do not use equipment with carbide cutting teeth to grind the pavement unless authorized.

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

Corrected HMA pavement areas must be uniform rectangles with edges:

1. Parallel to the nearest HMA pavement edge or lane line
2. Perpendicular to the pavement centerline
On ground areas not to be overlaid with OGFC, apply fog seal coat under section 37-2.

Where corrections are made within areas requiring testing with inertial profiler, reprofile the entire lane length with the inertial profiler device.

Where corrections are made within areas requiring testing with a 12-foot straightedge, retest the corrected area with the straightedge.

**39-1.03Q Data Cores**

Section 39-1.03Q applies if a bid item for data core is shown on the Bid Item List.

Take data cores of the completed HMA pavement, underlying base, and subbase material. Notify the Engineer 3 business days before coring.

Protect data cores and surrounding pavement from damage.

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

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

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

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

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

After data core summary and photograph submittal, dispose of cores.

**39-1.04 PAYMENT**

Geosynthetic pavement interlayer is measured by the square yard for the actual pavement area covered.

If tack coat, asphalt binder, and asphaltic emulsion are paid as separate bid items, their bid items are measured under section 92 or section 94.

The Department does not adjust the unit price for an increase or decrease in the tack coat quantity.

HMA of the type shown in the Bid Item List is measured based on the combined mixture weight. If recorded batch weights are printed automatically, the bid item for HMA is measured by using the printed batch weights, provided:

1. Total aggregate and supplemental fine aggregate weight per batch is printed. If supplemental fine aggregate is weighed cumulatively with the aggregate, the total aggregate batch weight must include the supplemental fine aggregate weight.
2. Total asphalt binder weight per batch is printed.
3. Each truckload's zero tolerance weight is printed before weighing the first batch and after weighing the last batch.
4. Time, date, mix number, load number and truck identification is correlated with a load slip.
5. Copy of the recorded batch weights is certified by a licensed weigh master and submitted.

Place hot mix asphalt dike of the type shown in the Bid Item List is measured along the completed length. Payment for the HMA used to construct the dike is not included in the payment for place hot mix asphalt dike.

Place hot mix asphalt (miscellaneous areas) is measured as the in-place compacted area. Payment for the HMA used for miscellaneous areas is not included in the payment for place hot mix asphalt (miscellaneous areas).

If replace asphalt concrete surfacing is shown, the bid item for replace asphalt concrete is measured based on the specified dimensions and any adjustments ordered.
The Department does not adjust the unit price for an increase or decrease in the prepaing grinding day quantity.

The Department reduces payment for noncompliance of HMA density based on the factors shown in the following table:

<table>
<thead>
<tr>
<th>HMA percent of maximum theoretical density</th>
<th>Reduced payment factor</th>
<th>HMA percent of maximum theoretical density</th>
<th>Reduced payment factor</th>
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<td>&gt; 99.0</td>
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</tbody>
</table>

39-2 TYPE A HOT MIX ASPHALT

39-2.01 GENERAL
39-2.01A Summary
Section 39-2 includes specifications for producing and placing Type A hot mix asphalt.

You may produce Type A HMA using an authorized warm mix asphalt technology.

39-2.01B Definitions
Reserved

39-2.01C Submittals
39-2.01C(1) General
Reserved

39-2.01C(2) Job Mix Formula
The JMF must be based on an HMA mix design determined as described in the Superpave Mix Design SP-2 Manual by the Asphalt Institute.

39-2.01C(3) Reclaimed Asphalt Pavement
Submit QC test results for RAP gradation with the combined aggregate gradation within 2 business days of taking RAP samples during HMA production.
39-2.01C(4)–39-2.01C(6)  Reserved
39-2.01D  Quality Control and Assurance
39-2.01D(1) General
Reserved
39-2.01D(2) Quality Control
39-2.01D(2)(a) General
Reserved
39-2.01D(2)(b) Aggregate

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradation(^a)</td>
<td>AASHTO T 27</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>Sand equivalent(^b, c)</td>
<td>AASHTO T 176</td>
<td></td>
</tr>
<tr>
<td>Moisture content(^d)</td>
<td>AASHTO T 329</td>
<td></td>
</tr>
<tr>
<td>Crushed particles</td>
<td>AASHTO T 335</td>
<td></td>
</tr>
<tr>
<td>Los Angeles rattler</td>
<td>AASHTO T 96</td>
<td></td>
</tr>
<tr>
<td>Flat and elongated</td>
<td>ASTM D4791</td>
<td>1 per 10,000 tons or 2 per project whichever is greater</td>
</tr>
<tr>
<td>particles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate angularity</td>
<td>AASHTO T 304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method A</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) If RAP is used, test the combined aggregate gradation under California Test 384.
\(^b\) Reported value must be the average of 3 tests from a single sample.
\(^c\) Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.
\(^d\) Test at continuous mixing plants only. If RAP is used, test the RAP moisture content at continuous mixing plant and batch mixing plant.

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during HMA production.

39-2.01D(2)(c) Reclaimed Asphalt Pavement

Sample and test processed RAP at a minimum frequency of 1 sample per 1000 tons with a minimum of 6 samples per fractionated stockpile. If the fractionated stockpile has not been augmented, the 3 RAP samples taken and tested for mix design may be part of this minimum sample requirement. If a fractionated RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

The combined RAP sample when tested under AASHTO T 164 must be within ±2.0 percent of the average asphalt binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form. If new fractionated RAP stockpiles are required, the average binder content of the new fractionated RAP stockpile must be within ±2.0 percent of the average binder reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

The combined RAP sample when tested under AASHTO T 209 must be within ±0.06 of the average maximum specific gravity reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

During HMA production, sample RAP twice daily and perform QC testing for:
1. Aggregate gradation at least once a day under California Test 384
2. Moisture content at least twice a day
Test the quality characteristics of HMA under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content</td>
<td>AASHTO T 308 Method A</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>HMA moisture content</td>
<td>AASHTO T 329</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
</tr>
<tr>
<td>Air voids content</td>
<td>AASHTO T 269</td>
<td>1 per 4,000 tons or 2 every 5 paving days, whichever is greater</td>
</tr>
<tr>
<td>Voids in mineral aggregate</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>1 per 10,000 tons or 2 per project whichever is greater</td>
</tr>
<tr>
<td>Dust proportion</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td></td>
</tr>
<tr>
<td>Density of core</td>
<td>California Test 375</td>
<td>2 per paving day</td>
</tr>
<tr>
<td>Nuclear gauge density</td>
<td>California Test 375</td>
<td>3 per 250 tons or 3 per paving day, whichever is greater</td>
</tr>
<tr>
<td>Hamburg wheel track</td>
<td>AASHTO T 324 (Modified)</td>
<td>1 per 10,000 tons or 1 per project, whichever is greater</td>
</tr>
<tr>
<td>Moisture susceptibility</td>
<td>AASHTO T 283</td>
<td></td>
</tr>
</tbody>
</table>

The Department accepts Type A HMA based on compliance with:

1. Aggregate quality requirements shown in the following table:
### Aggregate Quality

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation(^a)</td>
<td>AASHTO T 27</td>
<td>JMF ± Tolerance</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td>AASHTO T 335</td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>One-fractured face</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Two-fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>AASHTO T 96</td>
<td></td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Loss at 500 Rev.</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Sand equivalent (min.)(^b, c)</td>
<td>AASHTO T 176</td>
<td>47</td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight at 5:1)</td>
<td>ASTM D4791</td>
<td>10</td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %)(^d)</td>
<td>AASHTO T 304 Method A</td>
<td>45</td>
</tr>
</tbody>
</table>

\(^a\)The Engineer determines combined aggregate gradations containing RAP under California Test 384.

\(^b\)Reported value must be the average of 3 tests from a single sample.

\(^c\)Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.

\(^d\)The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

2. If RAP is used, RAP quality requirements shown in the following table:

### Reclaimed Asphalt Pavement Quality

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binder content (% within the average value reported)</td>
<td>AASHTO T 164</td>
<td>±2.0</td>
</tr>
<tr>
<td>Specific gravity (within the average value reported)</td>
<td>AASHTO T 209</td>
<td>±0.06</td>
</tr>
</tbody>
</table>

3. In-place HMA quality requirements shown in the following table:
### Type A HMA Acceptance In Place

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>AASHTO T 308 Method A</td>
<td>JMF -0.3, +0.5</td>
</tr>
<tr>
<td>HMA moisture content (max, %)</td>
<td>AASHTO T 329</td>
<td>1</td>
</tr>
<tr>
<td>Air voids content at $N_{\text{design}}$ (%)$^{a,b}$</td>
<td>AASHTO T 269</td>
<td>4 ± 1.5</td>
</tr>
<tr>
<td>Voids in mineral aggregate on plant-produced HMA (min, %)$^a$</td>
<td>SP-2 Asphalt Mixture Volumetrics$^c$</td>
<td>15.5–18.5, 14.5–17.5, 13.5–16.5, 12.5–15.5, 12.5–15.5, 13.5–16.5</td>
</tr>
<tr>
<td>Gradation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS$^g$ = 1-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS$^g$ = 3/4-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>0.6–1.3</td>
</tr>
<tr>
<td>Density of core (% of max theoretical density)$^a,f$</td>
<td>California Test 375</td>
<td>91–97</td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at 0.5-inch rut depth)</td>
<td>AASHTO T 324 (Modified)</td>
<td></td>
</tr>
<tr>
<td>Binder grade:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 58</td>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td>PG 64</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>PG 70</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td>PG 76 or higher</td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at inflection point)</td>
<td>AASHTO T 324 (Modified)</td>
<td></td>
</tr>
<tr>
<td>Binder grade:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 58</td>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td>PG 64</td>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td>PG 70</td>
<td></td>
<td>12,500</td>
</tr>
<tr>
<td>PG 76 or higher</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>Moisture susceptibility (min, psi, dry strength)</td>
<td>AASHTO T 283</td>
<td>100</td>
</tr>
<tr>
<td>Moisture susceptibility (min, psi, wet strength)</td>
<td>AASHTO T 283</td>
<td>70</td>
</tr>
</tbody>
</table>

$^a$Prepare 3 briquettes. Report the average of 3 tests.
$^b$The Engineer determines the bulk specific gravity of each lab-compacted briquette under AASHTO T 275, Method A, and theoretical maximum specific gravity under AASHTO T 209, Method A.
$^c$Determine bulk specific gravity under AASHTO T 275, Method A.
$^d$The Engineer determines the laboratory-prepared HMA value for mix design verification only.
$^e$The Engineer determines percent of theoretical maximum density under California Test 375 except the Engineer uses:
1. AASHTO T 275 to determine in-place density of each density core
2. AASHTO T 209, Method A to determine theoretical maximum density instead of calculating test maximum density
$^f$The Engineer determines theoretical maximum density under AASHTO T 209, Method A, at the frequency specified in California Test 375, Part 5. D.
$^g$NMAS means nominal maximum aggregate size.

### 39-2.02 MATERIALS

#### 39-2.02A General

Reserved
The mix design must comply with the requirements shown in the following table:

**Type A HMA Mix Design Requirements**

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air voids content (%)</td>
<td>AASHTO T 269&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$N_{\text{initial}} &gt; 8.0$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$N_{\text{design}} = 4.0$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$(N_{\text{des}} = 5.0$ for 1-inch aggregate) $N_{\text{max}} &gt; 2.0$</td>
</tr>
<tr>
<td>Gyration compaction (no. of gyrations)</td>
<td>AASHTO T 312</td>
<td>$N_{\text{initial}} = 8$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$N_{\text{design}} = 85.0$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$N_{\text{max}} = 130$</td>
</tr>
<tr>
<td>Voids in mineral aggregate (min, %)</td>
<td>SP-2</td>
<td>16.5–19.5</td>
</tr>
<tr>
<td>Gradation:</td>
<td>Asphalt Mixture Volumetrics</td>
<td>15.5–18.5</td>
</tr>
<tr>
<td>No. 4</td>
<td></td>
<td>14.5–17.5</td>
</tr>
<tr>
<td>3/8-inch</td>
<td></td>
<td>13.5–16.5</td>
</tr>
<tr>
<td>1/2-inch</td>
<td></td>
<td>13.5–16.5</td>
</tr>
<tr>
<td>3/4-inch</td>
<td></td>
<td>13.5–16.5</td>
</tr>
<tr>
<td>1-inch</td>
<td></td>
<td>13.5–16.5</td>
</tr>
<tr>
<td>with NMAS&lt;sup&gt;e&lt;/sup&gt; = 1-inch</td>
<td></td>
<td>14.5–17.5</td>
</tr>
<tr>
<td>with NMAS&lt;sup&gt;e&lt;/sup&gt; = 3/4-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion</td>
<td>SP-2</td>
<td>0.6–1.3</td>
</tr>
<tr>
<td></td>
<td>Asphalt Mixture Volumetrics</td>
<td></td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at 0.5-inch rut depth)</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10,000</td>
</tr>
<tr>
<td>Binder grade:</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>PG 58</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td>PG 64</td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>PG 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 76 or higher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at the inflection point)</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10,000</td>
</tr>
<tr>
<td>Binder grade:</td>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td>PG 58</td>
<td></td>
<td>12,500</td>
</tr>
<tr>
<td>PG 64</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>PG 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 76 or higher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture susceptibility, dry strength (min, psi)</td>
<td>AASHTO T 283&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100</td>
</tr>
<tr>
<td>Moisture susceptibility, wet strength (min, psi)</td>
<td>AASHTO T 283&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>70</td>
</tr>
</tbody>
</table>

<sup>a</sup>Calculate the air voids content of each specimen using AASHTO T 275, Method A, to determine bulk specific gravity. Use AASHTO T 209, Method A, to determine theoretical maximum specific gravity. Use a digital manometer and pycnometer when performing AASHTO T 209.

<sup>b</sup>Measure bulk specific gravity using AASHTO T 275, Method A.

<sup>c</sup>Test plant produced HMA.

<sup>d</sup>Freeze thaw required.

<sup>e</sup>NMAS means nominal maximum aggregate size.

For HMA mixtures using RAP, the maximum binder replacement is 25.0 percent for surface course and 40.0 percent for lower courses.
For HMA with a binder replacement percent less than or equal to 25 percent of your specified OBC, you may request that the performance graded asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For HMA with a binder replacement greater than 25 percent of your specified OBC and less than or equal to 40 percent of OBC, you must use a performance graded asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

39-2.02C Asphalt Binder
Reserved

39-2.02D Aggregates
39-2.02D(1) General
Before the addition of asphalt binder and lime treatment, the aggregate must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Quality</th>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of crushed particles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-fractured face</td>
<td>AASHTO T 335</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Two-fractured faces</td>
<td></td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td></td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Loss at 500 Rev.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand equivalent (min)\textsuperscript{a, b}</td>
<td></td>
<td>AASHTO T 176</td>
<td>47</td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight at 5:1)</td>
<td></td>
<td>ASTM D4791</td>
<td>10</td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %)\textsuperscript{c}</td>
<td></td>
<td>AASHTO T 304 Method A</td>
<td>45</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Reported value must be the average of 3 tests from a single sample.
\textsuperscript{b}Use of a Sand Reader Indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.
\textsuperscript{c}The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate, except if your JMF fails verification. Manufactured sand is fine aggregate produced by crushing rock or gravel.

39-2.02D(2) Aggregate Gradations
The aggregate gradations for Type A HMA must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Gradation Requirements</th>
<th>Type A HMA pavement thickness shown</th>
<th>Gradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 foot</td>
<td>3/8 inch</td>
<td></td>
</tr>
<tr>
<td>Greater than 0.10 to less than 0.20 foot</td>
<td>1/2 inch</td>
<td></td>
</tr>
<tr>
<td>0.20 foot to less than 0.25 foot</td>
<td>3/4 inch</td>
<td></td>
</tr>
<tr>
<td>0.25 foot or greater</td>
<td>3/4 inch or 1 inch</td>
<td></td>
</tr>
</tbody>
</table>
Aggregate gradation must be within the target value limits for the specified sieve size shown in the following tables:

<table>
<thead>
<tr>
<th>Aggregate Gradations</th>
<th>Sieve size</th>
<th>Target value limit</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1-inch</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot;</td>
<td></td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td></td>
<td>88–93</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td></td>
<td>72–85</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td></td>
<td>55–70</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td></td>
<td>35–52</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td></td>
<td>22–40</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td></td>
<td>8–24</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 50</td>
<td></td>
<td>5–18</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 200</td>
<td></td>
<td>3–7</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

| **3/4-inch**           |            |                    |                     |
| 1"                    |            | 100                | --                  |
| 3/4"                  |            | 90–98              | TV ± 5              |
| 1/2"                  |            | 70–90              | TV ± 6              |
| No. 4                 |            | 42–58              | TV ± 5              |
| No. 8                 |            | 29–43              | TV ± 5              |
| No. 30                |            | 10–23              | TV ± 4              |
| No. 200               |            | 2–7                | TV ± 2              |

| **1/2-inch**           |            |                    |                     |
| 3/4"                  |            | 100                | --                  |
| 1/2"                  |            | 95–98              | TV ± 5              |
| 3/8"                  |            | 72–95              | TV ± 5              |
| No. 4                 |            | 52–69              | TV ± 5              |
| No. 8                 |            | 35–55              | TV ± 5              |
| No. 30                |            | 15–30              | TV ± 4              |
| No. 200               |            | 2–8                | TV ± 2              |

| **3/8-inch**           |            |                    |                     |
| 1/2"                  |            | 100                | --                  |
| 3/8"                  |            | 95–98              | TV ± 5              |
| No. 4                 |            | 55–75              | TV ± 5              |
| No. 8                 |            | 30–50              | TV ± 5              |
| No. 30                |            | 15–35              | TV ± 5              |
| No. 200               |            | 2–9                | TV ± 2              |

| **No. 4**              |            |                    |                     |
| 3/8"                  |            | 100                | --                  |
| No. 4                 |            | 95–98              | TV ± 5              |
| No. 8                 |            | 70–80              | TV ± 6              |
| No. 30                |            | 34–45              | TV ± 5              |
| No. 200               |            | 2–12               | TV ± 4              |
39-2.02E Reclaimed Asphalt Pavement

You may substitute RAP for part of the virgin aggregate in a quantity up to a maximum of 25 percent of the aggregate blend.

Provide enough space for meeting all RAP handling requirements at your facility. Provide a clean, graded base, well drained area for stockpiles.

If RAP is from multiple sources, blend the RAP thoroughly and completely before fractionating.

For RAP substitution of 15 percent or less, fractionation is not required.

For RAP substitution greater than 15 percent, fractionate RAP stockpiles into 2 sizes, a coarse fraction RAP retained on 3/8-inch sieve, and a fine fraction RAP passing 3/8-inch sieve.

The RAP fractionation must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>RAP Stockpile Fractionation Gradation Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality characteristic</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Coarse (% passing the 1-inch sieve)</td>
</tr>
<tr>
<td>Fine (% passing the 3/8-inch sieve)</td>
</tr>
</tbody>
</table>

\(^a\)Maximum mechanical shaking time is 10 minutes

You may use the coarse fractionated stockpile, the fine fractionated stockpile, or a combination of the coarse and fine fractionated stockpiles.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

39-2.02F Hot Mix Asphalt Production

If RAP is used, the asphalt plant must automatically adjust the virgin asphalt binder to account for RAP percentage and RAP binder.

During production, you may adjust hot or cold-feed proportion controls for virgin aggregate and RAP. RAP must be within ±3 of RAP percentage shown in your Contractor Job Mix Formula Proposal form without exceeding 25 percent.

The aggregate temperature requirements do not apply to RAP.

39-2.03 CONSTRUCTION

Spread Type A HMA at the atmospheric and surface temperatures shown in the following table:

<table>
<thead>
<tr>
<th>Minimum Atmospheric and Surface Temperatures for Type A HMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compacted layer thickness, feet</td>
</tr>
<tr>
<td>Unmodified asphalt binder</td>
</tr>
<tr>
<td>＜0.15</td>
</tr>
<tr>
<td>≥0.15</td>
</tr>
</tbody>
</table>

For method compaction, the maximum compacted layer thickness must be 0.25 foot.

For Type A HMA 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 250 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 150 degrees F
2. Modified, complete:
   2.1. 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2.2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
2.3. Finish compaction before the surface temperature drops below 140 degrees F

If you request and the Engineer authorizes, you may cool Type A HMA with water when rolling activities are complete. Apply water under section 17.

39-2.04 PAYMENT
Not Used

39-3 RUBBERIZED HOT MIX ASPHALT–GAP GRADED

39-3.01 GENERAL

39-3.01A Summary
Section 39-3 includes specifications for producing and placing rubberized hot mix asphalt–gap graded.

You may produce RHMA-G using a warm mix asphalt technology.

39-3.01B Definitions
Reserved

39-3.01C Submittals
39-3.01C(1) General

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder blending 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.

At least 10 days before RHMA-G production, submit the name of an authorized laboratory to perform QC testing for asphalt rubber binder. The authorized laboratory must comply with the Caltrans Independent Assurance Program.

39-3.01C(2) Job Mix Formula
With your proposed JMF include MSDS for:

1. Base asphalt binder
2. CRM and asphalt modifier
3. Blended asphalt rubber binder components

The JMF must be based on an HMA mix design determined as described in the Superpave Mix Design SP-2 Manual by the Asphalt Institute.

39-3.01C(3) Asphalt Rubber Binder
Submit a proposal for asphalt rubber binder design and profile. In the design, include the asphalt binder, asphalt modifier, and CRM and their proportions.

If you change asphalt rubber binder supplier or any component material used in asphalt rubber binder or its percentage, submit a new JMF.

For the asphalt rubber binder used, submit:

1. Log of production daily.
2. Certificate of compliance with test results for CRM and asphalt modifier with each truckload delivered to the HMA plant. The certificate of compliance for asphalt modifier must represent no more than 5,000 lb.
3. Certified weight slips for the CRM and asphalt modifier furnished.

4. QC test results on viscosity within 2 business days after sampling.
5. QC test results on cone penetration, resilience, and softening point within 3 business days after sampling.

Submit a certificate of compliance for the CRM and asphalt modifier. With the certificate of compliance, submit test results for CRM and asphalt modifier with each truckload delivered to the HMA plant.
39-3.01D Quality Control and Assurance

39-3.01D(1) General
Reserved

39-3.01D(2) Job Mix Formula Verification
If you request, the Engineer verifies RHMA-G quality requirements within 7 days of receiving all verification samples and after the JMF document submittal has been accepted.

39-3.01D(3) Quality Control

39-3.01D(3)(a) General
Reserved

39-3.01D(3)(b) Asphalt Rubber Binder

39-3.01D(3)(b)(i) General
The asphalt rubber binder blending plant must be authorized under the Department's Material Plant Quality Program.

Take asphalt rubber binder samples from the feed line connecting the asphalt rubber binder tank to the HMA plant.

39-3.01D(3)(b)(ii) Asphalt Modifier
Test asphalt modifier under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Asphalt Modifier for Asphalt Rubber Binder</th>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscoisty</td>
<td>ASTM D445</td>
<td>1 per shipment</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>ASTM D92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molecular Analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphaltene</td>
<td>ASTM D2007</td>
<td>1 per shipment</td>
<td></td>
</tr>
<tr>
<td>Aromatic</td>
<td>ASTM D2007</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

39-3.01D(3)(b)(iii) Crumb Rubber Modifier
Sample and test scrap tire CRM and high natural CRM separately. Test CRM under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Crumb Rubber Modifier for Asphalt Rubber Binder</th>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrap tire CRM gradation</td>
<td>California Test 385</td>
<td>1 per 10,000 lb</td>
<td></td>
</tr>
<tr>
<td>High natural CRM gradation</td>
<td>California Test 385</td>
<td>1 per 3,400 lb</td>
<td></td>
</tr>
<tr>
<td>Wire in CRM</td>
<td>California Test 385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric in CRM</td>
<td>California Test 385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRM particle length</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRM specific gravity</td>
<td>California Test 208</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural rubber content in high natural CRM</td>
<td>ASTM D297</td>
<td>1 per 3,400 lb</td>
<td></td>
</tr>
</tbody>
</table>

Sample and test scrap tire CRM and high natural CRM separately.

39-3.01D(3)(b)(iv) Asphalt Rubber Binder
Test asphalt rubber binder under the test methods and frequencies shown in the following table:
Retain the sample from each lot. Test 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 meet the specifications, take corrective action and notify the Engineer.

04-18-14

### 39-3.01D(3)(c) Aggregate

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradation</td>
<td>AASHTO T 27</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>Sand equivalent&lt;sup&gt;a&lt;/sup&gt;&lt;sup&gt;,b&lt;/sup&gt;</td>
<td>AASHTO T 176</td>
<td></td>
</tr>
<tr>
<td>Moisture content&lt;sup&gt;c&lt;/sup&gt;</td>
<td>AASHTO T 329</td>
<td></td>
</tr>
<tr>
<td>Crushed particles</td>
<td>AASHTO T 335</td>
<td></td>
</tr>
<tr>
<td>Los Angeles rattler</td>
<td>AASHTO T 96</td>
<td>1 per 10,000 tons or 2 per project, whichever is greater</td>
</tr>
<tr>
<td>Flat and elongated particles</td>
<td>ASTM D4791</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate angularity</td>
<td>AASHTO T 304 Method A</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.<br>
<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.<br>
<sup>c</sup>Test at continuous mixing plants only

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during RHMA-G production.

### 39-3.01D(3)(d) Hot Mix Asphalt Production

Test the quality characteristics of RHMA-G under the test methods and frequencies shown in the following table:
<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content</td>
<td>AASHTO T 308 Method A</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>HMA moisture content</td>
<td>AASHTO T 329</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
</tr>
<tr>
<td>Air voids content</td>
<td>AASHTO T 269</td>
<td>1 per 4,000 tons or 2 every 5 paving days, whichever is greater</td>
</tr>
<tr>
<td>Voids in mineral aggregate</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>1 per 10,000 tons or 2 per project whichever is greater</td>
</tr>
<tr>
<td>Dust proportion</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td></td>
</tr>
<tr>
<td>Density of core</td>
<td>California Test 375</td>
<td>2 per paving day</td>
</tr>
<tr>
<td>Nuclear gauge density</td>
<td>California Test 375</td>
<td>3 per 250 tons or 3 per paving day, whichever is greater</td>
</tr>
<tr>
<td>Hamburg wheel track</td>
<td>AASHTO T 324 (Modified)</td>
<td>1 per 10,000 tons or 1 per project whichever is greater</td>
</tr>
<tr>
<td>Moisture susceptibility</td>
<td>AASHTO T 283</td>
<td></td>
</tr>
</tbody>
</table>

**39-3.01D(4) Reserved**

**39-3.01D(5) Department Acceptance**

**39-3.01D(5)(a) General**
The Department accepts RHMA-G based on compliance with:

1. Aggregate quality requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation</td>
<td>AASHTO T 27</td>
<td>JMF ± Tolerance</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
<td>AASHTO T 335</td>
<td></td>
</tr>
<tr>
<td>One-fractured face</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Two-fractured faces</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Passing No. 4 sieve</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td>and retained on No. 8 sieve.)</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>AASHTO T 96</td>
<td></td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Loss at 500 Rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand equivalent (min)a, b</td>
<td>AASHTO T 176</td>
<td>47</td>
</tr>
<tr>
<td>Flat and elongated particles (max, %) by weight at 5:1</td>
<td>ASTM D4791</td>
<td>Report only</td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %) c</td>
<td>AASHTO T 304 Method A</td>
<td>45</td>
</tr>
</tbody>
</table>

   aReported value must be the average of 3 tests from a single sample.
   bUse of a sand reading Indicator is required as shown in AASHTO T 176, Figure 1.
   Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.
   cThe Engineer waives this specification if RHMA-G contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

2. In-place RHMA-G quality requirements shown in the following table:
### RHMA-G In-Place Acceptance

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>AASHTO T 308 Method A</td>
<td>JMF -0.4, +0.5</td>
</tr>
<tr>
<td>HMA moisture content (max, %)</td>
<td>AASHTO T 329</td>
<td>1</td>
</tr>
<tr>
<td>Air voids content @ N_{design} (%)a, b</td>
<td>AASHTO T 269</td>
<td>4.0 ± 1.5</td>
</tr>
<tr>
<td>Voids in mineral aggregate on laboratory-produced HMA (min, %)</td>
<td>SP-2 Asphalt Mixture Volumetricsc</td>
<td>18.0–23.0</td>
</tr>
<tr>
<td>Gradation: 1/2-inch and 3/4-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids in mineral aggregate on plant-produced HMA (min, %)</td>
<td>SP-2 Asphalt Mixture Volumetricsc</td>
<td>18.0–23.0</td>
</tr>
<tr>
<td>Gradation: 1/2-inch and 3/4-inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportiona</td>
<td>SP-2 Asphalt Mixture Volumetrics</td>
<td>Report only</td>
</tr>
<tr>
<td>Density of core (% of max theoretical density)e, f</td>
<td>California Test 375</td>
<td>91–97</td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at 0.5-inch rut depth)</td>
<td>AASHTO T 324 (Modified)</td>
<td></td>
</tr>
<tr>
<td>Binder grade: PG 58</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>PG 64</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>PG 70</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Hamburg wheel track (min number of passes at inflection point)</td>
<td>AASHTO T 324 (Modified)</td>
<td></td>
</tr>
<tr>
<td>Binder grade: PG 58</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>PG 64</td>
<td>12,500</td>
<td></td>
</tr>
<tr>
<td>PG 70</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Moisture susceptibility (min, psi, dry strength)</td>
<td>AASHTO T 283</td>
<td>100</td>
</tr>
<tr>
<td>Moisture susceptibility (min, psi, wet strength)</td>
<td>AASHTO T 283</td>
<td>70</td>
</tr>
</tbody>
</table>

*aPrepare 3 briquettes. Report the average of 3 tests.

*bThe Engineer determines the bulk specific gravity of each lab-compacted briquette under AASHTO T 275, Method A, and theoretical maximum specific gravity under AASHTO T 209, Method A.

*cDetermine bulk specific gravity under AASHTO T 275, Method A.

*dThe Engineer determines the laboratory-prepared RHMA-G value for mix design verification only.

*eThe Engineer determines percent of theoretical maximum density under California Test 375 except the Engineer uses:
   1. AASHTO T 275, Method A, to determine in-place density of each density core instead of using the nuclear gauge
   2. AASHTO T 209, Method A to determine theoretical maximum density instead of calculating test maximum density.

*fThe Engineer determines theoretical maximum density under AASHTO T 209, Method A, at the frequency specified in California Test 375, Part 5. D.

### 39-3.01D(5)(b) Asphalt Rubber Binder
### 39-3.01D(5)(b)(i) General
The Department does not use asphalt rubber binder design profile for production acceptance.

### 39-3.01D(5)(b)(ii) Asphalt Modifier
The Department accepts asphalt modifier based on compliance with the requirements shown in the following table:
### Asphalt Modifier for Asphalt Rubber Binder

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity at 100 °C (m²/s x 10⁻⁶)</td>
<td>ASTM D445</td>
<td>X ± 3a</td>
</tr>
<tr>
<td>Flash point (min, °C)</td>
<td>ASTM D92</td>
<td>207</td>
</tr>
</tbody>
</table>

**Molecular Analysis**

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphaltenes (max, % by mass (max))</td>
<td>ASTM D2007</td>
<td>0.1</td>
</tr>
<tr>
<td>Aromatics (min % by mass)</td>
<td>ASTM D2007</td>
<td>55</td>
</tr>
</tbody>
</table>

*aThe symbol "X" is the asphalt modifier viscosity.

### 39-3.01D(5)(b)(iii) Crumb Rubber Modifier

The Department accepts scrap tire CRM and high natural CRM based on compliance with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Crumb Rubber Modifier for Asphalt Rubber Binder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality characteristic</strong></td>
</tr>
<tr>
<td>Scrap tire CRM gradation (% passing No. 8 sieve)</td>
</tr>
<tr>
<td>High natural CRM gradation (% passing No. 10 sieve)</td>
</tr>
<tr>
<td>Wire in CRM (max, %)</td>
</tr>
<tr>
<td>Fabric in CRM (max, %)</td>
</tr>
<tr>
<td>CRM particle length (max, in)</td>
</tr>
<tr>
<td>CRM specific gravity</td>
</tr>
</tbody>
</table>

Scrap tire CRM and high natural CRM are sampled and tested separately.

### 39-3.01D(5)(b)(iv) Asphalt Rubber Binder

10-17-14

For Department acceptance testing, take samples in the Engineer's presence of asphalt rubber binder in 6 qt cans with open tops and friction lids. Take samples once per day or every 5 lots, whichever is greater.

The Department accepts asphalt rubber binder based on compliance with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cone penetration at 25 °C (0.10 mm)</td>
<td>ASTM D217</td>
<td>25–70</td>
</tr>
<tr>
<td>Resilience at 25 °C (min, % rebound)</td>
<td>ASTM D5329</td>
<td>18</td>
</tr>
<tr>
<td>Softening point (°C)</td>
<td>ASTM D36</td>
<td>52–74</td>
</tr>
<tr>
<td>Viscosity at 190 °C (centipoises)*</td>
<td>ASTM D7741</td>
<td>1,500–4,000</td>
</tr>
</tbody>
</table>

*Prepare sample for viscosity test under California Test 388.

### 39-3.01D(5)(c)–39-3.01D(5)(f) Reserved

### 39-3.02 MATERIALS

### 39-3.02A General

Reserved
## RHMA-G Mix Design Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air voids content (%)</td>
<td>AASHTO T 269&lt;sup&gt;a&lt;/sup&gt;</td>
<td>( N_{\text{design}} = 4.0 )</td>
</tr>
<tr>
<td>Gyration compaction (no. of gyrations)</td>
<td>AASHTO T 312</td>
<td>( N_{\text{design}} = 50–150^\circ )</td>
</tr>
<tr>
<td>Voids in mineral aggregate (min, %)</td>
<td>SP-2, Asphalt Mixture Volumetrics&lt;sup&gt;c&lt;/sup&gt;</td>
<td>18.0–23.0</td>
</tr>
<tr>
<td>Dust proportion</td>
<td>SP-2, Asphalt Mixture Volumetrics</td>
<td>Report only</td>
</tr>
<tr>
<td>Hamburg wheel track</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(min number of passes at 0.5-inch rut depth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binder grade:</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 58</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 64</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 70</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamburg wheel track</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>(min number of passes at the inflection point)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binder grade:</td>
<td>AASHTO T 324 (Modified)&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 58</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 64</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG 70</td>
<td>12,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture susceptibility, dry strength (min, psi)</td>
<td>AASHTO T 283&lt;sup&gt;e&lt;/sup&gt;</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture susceptibility, wet strength (min, psi)</td>
<td>AASHTO T 283&lt;sup&gt;ace&lt;/sup&gt;</td>
<td>70</td>
</tr>
</tbody>
</table>

<sup>a</sup>Calculate the air voids content of each specimen using AASHTO T 275, Method A, to determine bulk specific gravity and AASHTO T 209, Method A, to determine theoretical maximum specific gravity. Under AASHTO T 209 use a digital manometer and pycnometer when performing AASHTO T 209.

<sup>b</sup>Superpave gyratory compactor ram pressure may be increased to a maximum of 825kPa, and specimens may be held at a constant height for a maximum of 90 minutes.

<sup>c</sup>Measure bulk specific gravity using AASHTO T 275, Method A.

<sup>d</sup>Test plant produced RHMA.

<sup>e</sup>Freeze thaw required.

Determine the amount of asphalt rubber binder to be mixed with the aggregate for RHMA-G as follows:

1. Base the calculations on the average of 3 briquettes produced at each asphalt rubber binder content.
2. Plot asphalt rubber binder content versus average air voids content for each set of 3 specimens and connect adjacent points with a best-fit curve.
3. Calculate voids in mineral aggregate for each specimen, average each set, and plot the average versus asphalt rubber binder content.
4. Calculate the dust proportion and plot versus asphalt rubber binder content.
5. From the curve plotted, select the theoretical asphalt rubber binder content at 4 percent air voids.
6. At the selected asphalt rubber binder content, calculate dust proportion.
7. Record the asphalt rubber binder content in the Contractor Hot Mix Asphalt Design Data Form as the OBC.

The OBC must not fall below 7.5 percent by total weight of the mix.

Laboratory mixing and compaction must comply with AASHTO R 35, except the mixing temperature of the aggregate must be between 300 and 325 degrees F. The mixing temperature of the asphalt rubber binder must
be between 375 and 425 degrees F. The compaction temperature of the combined mixture must be between 290 and 320 degrees F.

39-3.02C Asphalt Rubber Binder

39-3.02C(1) General

Asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. CRM

The combined asphalt binder and asphalt modifier must be 80.0 ± 2.0 percent by weight of the asphalt rubber binder.

39-3.02C(2) Asphalt Modifier

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon, and must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity at 100 °C (m²/s x 10^-6)</td>
<td>ASTM D445</td>
<td>X ± 3⁶</td>
</tr>
<tr>
<td>Flash point (min, °C)</td>
<td>ASTM D92</td>
<td>207</td>
</tr>
</tbody>
</table>

Molecular Analysis

| Asphaltenes (max, % by mass) | ASTM D2007 | 0.1 |
| Aromatics (min, % by mass)   | ASTM D2007  | 55  |

³The symbol "X" is the proposed asphalt modifier viscosity. "X" must be between 19 and 36. A change in "X" requires a new asphalt rubber binder design.

Asphalt modifier must be from 2.0 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder.

39-3.02C(3) Crumb Rubber Modifier

CRM must be a ground or granulated combination of scrap tire CRM and high natural CRM. CRM must be 75.0 ± 2.0 percent scrap tire CRM and 25.0 ± 2.0 percent high natural CRM by total weight of CRM. Scrap tire CRM must be from any combination of automobile tires, truck tires, or tire buffings.

The CRM must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrap tire CRM gradation (% passing No. 8 sieve)</td>
<td>California Test 385</td>
<td>100</td>
</tr>
<tr>
<td>High natural CRM gradation (% passing No. 10 sieve)</td>
<td>California Test 385</td>
<td>100</td>
</tr>
<tr>
<td>Wire in CRM (max, %)</td>
<td>California Test 385</td>
<td>0.01</td>
</tr>
<tr>
<td>Fabric in CRM (max, %)</td>
<td>California Test 385</td>
<td>0.05</td>
</tr>
<tr>
<td>CRM particle length (max, in)²</td>
<td>--</td>
<td>3/16</td>
</tr>
<tr>
<td>CRM specific gravity</td>
<td>California Test 208</td>
<td>1.1–1.2</td>
</tr>
<tr>
<td>Natural rubber content in high natural CRM (%)</td>
<td>ASTM D297</td>
<td>40.0–48.0</td>
</tr>
</tbody>
</table>

²Test at mix design and for certificate of compliance.

CRM must be ground or granulated at ambient temperature. If steel and fiber are cryogenically separated, separation must occur before grinding or granulating. Cryogenically produced CRM particles must be ground or granulated and not pass through the grinder or granulator.

CRM must be dry, free-flowing particles that do not stick together. CRM must not cause foaming when combined with the asphalt binder and asphalt modifier. You may add calcium carbonate or talc up to 3 percent by weight of CRM.
39-3.02C(4) Design and Profile

Design the asphalt rubber binder from testing you perform for each quality characteristic and for the reaction temperatures expected during production. The profile must include the same component sources for the asphalt rubber binder used. The 24-hour (1,440-minute) interaction period determines the design profile. At a minimum, mix asphalt rubber binder components, take samples, and perform and record the tests shown in the following table:

### Asphalt Rubber Binder Reaction Design Profile

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test Method</th>
<th>Minutes of reaction a</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>45 60 90 120 240 360 1440</td>
<td></td>
</tr>
<tr>
<td>Cone penetration at 25 °C (0.10 mm)</td>
<td>ASTM D217</td>
<td>X X X X X X X</td>
<td>25–70</td>
</tr>
<tr>
<td>Resilience at 25 °C (min, % rebound)</td>
<td>ASTM D5329</td>
<td>X X X X X</td>
<td>18</td>
</tr>
<tr>
<td>Field softening point (°C)</td>
<td>ASTM D36</td>
<td>X X X X X X X</td>
<td>52–74</td>
</tr>
<tr>
<td>Viscosity (centipoises)</td>
<td>ASTM D7741</td>
<td>X X X X X X X</td>
<td>1,500–4,000</td>
</tr>
</tbody>
</table>

aSix hours (360 minutes) after CRM addition, reduce the oven temperature to 275 °F for 16 hours. After the 16-hour (960 minutes) cool down after CRM addition, reheat the binder to the reaction temperature expected during production for sampling and testing at 24 hours (1,440 minutes).

b"X" denotes required testing

39-3.02C(5) Asphalt Rubber Binder Production

39-3.02C(5)(a) General

Deliver scrap tire CRM and high natural CRM in separate bags.

39-3.02C(5)(b) Mixing

Proportion and mix asphalt binder, asphalt modifier, and CRM simultaneously or premix the asphalt binder and asphalt modifier before adding CRM. If you premix asphalt binder and asphalt modifier, mix them for at least 20 minutes. When you add CRM, the asphalt binder and asphalt modifier must be from 375 to 440 degrees F.

After interacting for at least 45 minutes, the quality characteristics of asphalt rubber binder must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cone penetration at 25 °C (0.10 mm)</td>
<td>ASTM D217</td>
<td>25–70</td>
</tr>
<tr>
<td>Resilience at 25 °C (min, % rebound)</td>
<td>ASTM D5329</td>
<td>18</td>
</tr>
<tr>
<td>Softening point (°C)</td>
<td>ASTM D36</td>
<td>52–74</td>
</tr>
<tr>
<td>Viscosity at 190 °C (centipoises) a</td>
<td>ASTM D7741</td>
<td>1,500–4,000</td>
</tr>
</tbody>
</table>

aPrepare sample for viscosity test under California Test 388.

Do not use asphalt rubber binder during the first 45 minutes of the reaction period. During this period, the asphalt rubber binder mixture must be between 375 degrees F and the lower of 425 or 25 degrees F below the asphalt binder’s flash point indicated in the MSDS.

If any asphalt rubber binder is not used within 4 hours after the reaction period, discontinue heating. If the asphalt rubber binder drops below 375 degrees F, reheat before use. If you add more scrap tire CRM to the reheated asphalt rubber binder, the binder must undergo a 45-minute reaction period. The added scrap tire CRM must not exceed 10 percent of the total asphalt rubber binder weight. Reheated and reacted asphalt rubber binder must comply with the viscosity specifications. Do not reheat asphalt rubber binder more than twice.
39-3.02D Aggregates

39-3.02D(1) General
For RHMA-G, before the addition of asphalt binder and lime treatment, the aggregate must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Quality</th>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of crushed particles</td>
<td>Coarse aggregate (min, %)</td>
<td>AASHTO T 335</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>One-fractured face</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Two-fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One fractured face</td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>Loss at 100 Rev.</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Loss at 500 Rev.</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Sand equivalent (min)(^a),(^b)</td>
<td>AASHTO T 176</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight at 5:1)</td>
<td>ASTM D4791</td>
<td>Report only</td>
<td></td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %)(^c)</td>
<td>AASHTO T 304 Method A</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Reported value must be the average of 3 tests from a single sample.
\(^b\)Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.
\(^c\)The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate, except if your JMF fails verification. Manufactured sand is fine aggregate produced by crushing rock or gravel.

39-3.02D(2) Aggregate Gradations
The aggregate gradations for RHMA-G must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Gradation Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A HMA pavement thickness shown</td>
</tr>
<tr>
<td>0.10 to less than 0.20 foot</td>
</tr>
<tr>
<td>0.20 foot or greater</td>
</tr>
</tbody>
</table>

For RHMA-G, the aggregate gradations must be within the target value limits for the specified sieve size shown in the following tables:
Aggregate Gradation
(Percentage Passing)
Rubberized Hot Mix Asphalt - Gap Graded (RHMA-G)

### 3/4-inch RHMA-G

<table>
<thead>
<tr>
<th>Sieve Sizes</th>
<th>Target Value Limits</th>
<th>Allowable Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>100</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>95–98</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>83–87</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>65–70</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 4</td>
<td>28–42</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 8</td>
<td>14–22</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 200</td>
<td>0–6</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

### 1/2-inch RHMA-G

<table>
<thead>
<tr>
<th>Sieve Sizes</th>
<th>Target Value Limits</th>
<th>Allowable Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>90–98</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>83–87</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 4</td>
<td>28–42</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 8</td>
<td>14–22</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 200</td>
<td>0–6</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

39-3.02E Rubberized Hot Mix Asphalt Production
Asphalt rubber binder must be from 375 to 425 degrees F when mixed with aggregate.

If the dry and wet moisture susceptibility test result for treated plant-produced RHMA-G is less than the RHMA-G mix design requirement for dry and wet moisture susceptibility strength, the minimum dry and wet strength requirement is waived, but you must use one of the following treatments:

1. Aggregate lime treatment using the slurry method
2. Aggregate lime treatment using the dry lime method
3. Liquid antistrip treatment of HMA

39-3.03 CONSTRUCTION
Use a material transfer vehicle when placing RHMA-G.

Do not use a pneumatic tired roller to compact RHMA-G.

Spread and compact RHMA-G at an atmospheric temperature of at least 55 degrees F and a surface temperature of at least 60 degrees F.

If the atmospheric temperature is below 70 degrees F, cover loads in trucks with tarps. The tarps must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface. Tarps are not required if the time from discharge to truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

For RHMA-G placed under method compaction:

1. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 285 degrees F.
2. Complete breakdown and intermediate compaction before the surface temperature drops below 250 degrees F. Use a static steel-tired roller instead of the pneumatic-tired roller for intermediate compaction.
3. Complete finish compaction before the surface temperature drops below 200 degrees F.

10-17-14
Spread sand at a rate between 1 and 2 lb/sq yd on new RHMA-G pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(3). Keep traffic off the pavement until spreading sand is complete.

39-3.04 PAYMENT
Not Used

39-4 OPEN GRADED FRICTION COURSES

39-4.01 GENERAL
39-4.01A Summary
Section 39-4 includes specifications for producing and placing open graded friction courses. Open graded friction courses include HMA-O, RHMA-O, and RHMA-O-HB.

You may produce OGFC using a warm mix asphalt technology.

39-4.01B Definitions
Reserved

39-4.01C Submittals
Submit a complete JMF, except do not specify an asphalt binder content.

39-4.01D Quality Control and Assurance
39-4.01D(1) General
Reserved

39-4.01D(2) Quality Control
39-4.01D(2)(a) General
Reserved

39-4.01D(2)(b) Asphalt Rubber Binder
For RHMA-O and RHMA-O-HB, the asphalt rubber binder must comply with the specifications in 39-3.01D(2)(b).

39-4.01D(2)(c) Aggregate
Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradation</td>
<td>AASHTO T 27</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>Moisture content*</td>
<td>AASHTO T 329</td>
<td>1 per 1500 tons and any remaining part</td>
</tr>
<tr>
<td>Crushed particles</td>
<td>AASHTO T 335</td>
<td>1 per 10,000 tons or 2 per project, whichever is greater</td>
</tr>
<tr>
<td>Los Angeles rattler</td>
<td>AASHTO T 96</td>
<td></td>
</tr>
<tr>
<td>Flat and elongated particles</td>
<td>ASTM D4791</td>
<td></td>
</tr>
</tbody>
</table>

*Test at continuous mixing plants only

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during OGFC production.

39-4.01D(2)(d) Hot Mix Asphalt Production
Test the quality characteristics of OGFC under the test methods and frequencies shown in the following table:
OGFC Testing Frequencies

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content</td>
<td>AASHTO T 308 Method A</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>HMA moisture content</td>
<td>AASHTO T 329</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
</tr>
</tbody>
</table>

39-4.01D(3) Department Acceptance

39-4.01D(3)(a) General

The Department accepts OGFC based on compliance with:

1. Aggregate quality requirements shown in the following table:

Aggregate Quality

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation</td>
<td>AASHTO T 27</td>
<td>JMF ± Tolerance</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-fractured face</td>
<td>AASHTO T 335</td>
<td>90</td>
</tr>
<tr>
<td>Two-fractured faces</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Loss at 500 Rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight @ 5:1)</td>
<td>ASTM D4791</td>
<td>Report only</td>
</tr>
</tbody>
</table>

2. In-place OGFC quality requirements shown in the following table:

OGFC Acceptance In Place

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>AASHTO T 308 Method A</td>
<td>JMF -0.4, +0.5</td>
</tr>
<tr>
<td>HMA moisture content (max, %)</td>
<td>AASHTO T 329</td>
<td>1</td>
</tr>
</tbody>
</table>

39-4.01D(3)(b) Asphalt Rubber Binder

The Department accepts asphalt rubber binder in RHMA-O and RHMA-O-HB under 39-3.01D(5)(b).

39-4.01D(3)(c) Pavement Smoothness

Pavement smoothness of OGFC must comply with the Mean Roughness Index requirements shown in the following table for a 0.1 mile section:
OGFC Pavement Smoothness Acceptance Criteria

<table>
<thead>
<tr>
<th>OGFC placement on</th>
<th>Mean Roughness Index requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>New construction or HMA overlay</td>
<td>60 in/mi or less</td>
</tr>
<tr>
<td>Existing pavement</td>
<td>75 in/mi or less</td>
</tr>
<tr>
<td>Milled surface</td>
<td>75 in/mi or less</td>
</tr>
</tbody>
</table>

39-4.01D(3)(d)–39-4.01D(3)(f) Reserved

39-4.02 MATERIALS

39-4.02A General
When mixed with asphalt binder, aggregate must not be more than 325 degrees F except aggregate for OGFC with unmodified asphalt binder must be not more than 275 degrees F.

39-4.02B Mix Design
The Department determines the asphalt binder content under California Test 368 within 20 days of your complete JMF submittal and provides you a Caltrans Hot Mix Asphalt Verification form.

For OGFC, the 1st paragraph of section 39-1.02B(1) does not apply.

39-4.02C Asphalt Binder
Asphalt rubber binder in RHMA-O and RHMA-O-HB must comply with section 39-3.02B.

39-4.02D Aggregate

39-4.02D(1) General
Aggregate must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality characteristic</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
</tr>
<tr>
<td>One-fractured face</td>
</tr>
<tr>
<td>Two-fractured faces</td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
</tr>
<tr>
<td>One fractured face</td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
</tr>
<tr>
<td>Loss at 500 Rev.</td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight at 5:1)</td>
</tr>
</tbody>
</table>

39-4.02D(2) Aggregate Gradations
The aggregate gradations for HMA-O must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Gradation Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA-O pavement thickness shown</td>
</tr>
<tr>
<td>0.10 foot or greater to less than 0.15 foot</td>
</tr>
<tr>
<td>0.15 foot or greater</td>
</tr>
</tbody>
</table>

The aggregate gradations for RHMA-O and RHMA-O-HB must comply with the requirements shown in the following table:
Aggregate Gradation Requirements

<table>
<thead>
<tr>
<th>RHMA-O and RHMA-O-HB pavement thickness shown</th>
<th>Gradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 foot or greater</td>
<td>1/2 inch</td>
</tr>
</tbody>
</table>

For RHMA-O and RHMA-O-HB, the 1-inch aggregate gradation is not allowed.

For OGFC, the aggregate gradations must be within the target value limits for the specified sieve size shown in the following tables:

### Aggregate Gradations
(Percentage Passing)
Open Graded Friction Course (OGFC)

<table>
<thead>
<tr>
<th>Sieve size</th>
<th>Target value limit</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>1&quot;</td>
<td>99–100</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>85–96</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>55–71</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td>10–25</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>6–16</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 200</td>
<td>0–6</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sieve size</th>
<th>Target value limit</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>95–100</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>78–89</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td>28–37</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>7–18</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td>0–10</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 200</td>
<td>0–3</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

If lime treatment is required, you may reduce the lime ratio for the combined aggregate from 1.0 to 0.5 percent for OGFC.

**39-4.03 CONSTRUCTION**

Use a material transfer vehicle when placing OGFC.

If the atmospheric temperature is below 70 degrees F, cover loads in trucks with tarps. The tarps must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface. Tarps are not required if the time from discharge to truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

Apply a tack coat before placing OGFC. The tack coat application rate must comply with the requirements of the following table:
Tack Coat Application Rates for OGFC

<table>
<thead>
<tr>
<th>OGFC over:</th>
<th>Minimum Residual Rates (gal/sq yd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSS1/CSS1h,</td>
</tr>
<tr>
<td></td>
<td>SS1/SS1h and</td>
</tr>
<tr>
<td></td>
<td>QS1h/QS1h and</td>
</tr>
<tr>
<td></td>
<td>Asphaltic</td>
</tr>
<tr>
<td></td>
<td>Emulsion</td>
</tr>
<tr>
<td>CSS1/CSS1,</td>
<td>CRS1/CRS2,</td>
</tr>
<tr>
<td>SS1/SS1h and</td>
<td>RS1/RS2 and</td>
</tr>
<tr>
<td>QS1h/QS1h and</td>
<td>QS1/CQS1 and</td>
</tr>
<tr>
<td>Asphaltic</td>
<td>Asphaltic</td>
</tr>
<tr>
<td>Emulsion</td>
<td>Emulsion</td>
</tr>
<tr>
<td>CRS1/CRS2,</td>
<td>Asphaltic</td>
</tr>
<tr>
<td>RS1/RS2 and</td>
<td>Emulsion</td>
</tr>
<tr>
<td>QS1/CQS1 and</td>
<td>Asphaltic Emulsion</td>
</tr>
<tr>
<td>Asphaltic</td>
<td>Emulsion</td>
</tr>
<tr>
<td>PMRS2/PMCRS2 and</td>
<td>PMRS2h/PMCRS2h and</td>
</tr>
<tr>
<td>Asphaltic Emulsion</td>
<td>Asphaltic Emulsion</td>
</tr>
<tr>
<td>New HMA</td>
<td>0.03</td>
</tr>
<tr>
<td>PCC and existing AC surfacing</td>
<td>0.05</td>
</tr>
<tr>
<td>Planed pavement</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Compact OGFC with steel-tired, 2-axle tandem rollers. If placing over 300 tons of OGFC per hour, use at least 3 rollers for each paver. If placing less than 300 tons of OGFC per hour, use at least 2 rollers for each paver. Each roller must weigh between 126 to 172 lb per linear inch of drum width. Turn the vibrator off.

Compact OGFC with 2 coverages. The Engineer may order fewer coverages if the layer thickness of OGFC is less than 0.20 foot.

For HMA-O with unmodified asphalt binder:
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.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 200 degrees F.

For HMA-O with modified asphalt binder except asphalt rubber binder:
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. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 180 degrees F.

For RHMA-O and RHMA-O-HB:
1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and surface temperature is at least 60 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 280 degrees F.
3. Complete compaction before the surface temperature drops below 250 degrees F.

Spread sand at a rate between 1 and 2 lb/sq yd on new RHMA-O and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(3). Keep traffic off the pavement until spreading sand is complete.

If you choose to correct OGFC for smoothness, the Engineer determines if the corrective method causes raveling. OGFC that is raveling must be removed and replaced.

39-4.04 PAYMENT
Not Used

39-5 BONDED WEARING COURSES

39-5.01 GENERAL
39-5.01A General
39-5.01A(1) Summary
Section 39-5 includes specifications for producing and placing bonded wearing courses.

BWC includes placing a polymer modified asphaltic emulsion and the specified HMA in a single pass with an integrated paving machine.

BWC using RHMA-G, RHMA-O, or HMA-O must comply with the specifications for RHMA-G, RHMA-O, or HMA-O.
39-5.01A(2) Definitions
Reserved

39-5.01A(3) Submittals
With your JMF submittal, include:

1. Asphaltic emulsion membrane target residual rate
2. Weight ratio of water to bituminous material in the original asphaltic emulsion

Within 3 business days following the 1st job site delivery, submit test results for asphaltic emulsion properties performed on a sample taken from the asphaltic emulsion delivered.

Within 1 business day of each job site delivery of asphaltic emulsion, submit to METS a 2-quart sample and a certificate of compliance. Ship each sample so that it is received at METS within 48 hours of sampling.

Each day BWC is placed, submit the residual and application rate for the asphaltic emulsion membrane.

During production, submit certified volume or weight slips for the materials supplied.

39-5.01A(4) Quality Control and Assurance

39-5.01A(4)(a) General
For each job site delivery of asphaltic emulsion, take a 2-quart sample in the presence of the Engineer. Take samples from the delivery truck at mid-load from a sampling tap or thief. If the sample is taken from the tap, draw and discard 4 quarts before sampling.

If you unload asphalt binder or asphaltic emulsion into a bulk storage tank, do not use material from the tank until you submit test results for a sample taken from the bulk storage tank. Testing must be performed by an AASHTO-accredited laboratory.

39-5.01A(4)(b) Quality Control
Sample BWC in two 1-gallon metal containers.

The asphaltic emulsion membrane must be tested under ASTM D2995 at least once per paving day at the job site.

39-5.01A(4)(c) Department Acceptance
The Department accepts asphaltic emulsion membrane based on compliance with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saybolt Furol Viscosity at 25 °C (SFS) a</td>
<td>AASHTO T 59</td>
<td>20–100</td>
</tr>
<tr>
<td>Sieve test on original emulsion at time of delivery (max, %)</td>
<td>AASHTO T 59</td>
<td>0.05</td>
</tr>
<tr>
<td>24-hour storage stability (max, %)</td>
<td>AASHTO T 59</td>
<td>1</td>
</tr>
<tr>
<td>Residue by evaporation (min, %)</td>
<td>California Test 331</td>
<td>63</td>
</tr>
</tbody>
</table>

Tests on residue from evaporation test:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torsional recovery, measure entire arc of recovery at 25 °C (min, %)</td>
<td>California Test 332</td>
<td>40</td>
</tr>
<tr>
<td>Penetration at 25 °C (0.01 mm)</td>
<td>AASHTO T 49</td>
<td>70–150</td>
</tr>
</tbody>
</table>

*SFS means Saybolt Furol seconds

The Department accepts the BWC based on the submitted asphaltic emulsion membrane target residual rate ±0.02 gal/sq yd when tested under ASTM D2995.
39-5.01B Materials

39-5.01B(1) General
Reserved

39-5.01B(2) Asphaltic Emulsion Membrane
The asphaltic emulsion membrane must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saybolt Furol Viscosity at 25 °C (SFS) a</td>
<td>AASHTO T 59</td>
<td>20–100</td>
</tr>
<tr>
<td>Sieve test on original emulsion at time of delivery (max, %)</td>
<td>AASHTO T 59</td>
<td>0.05</td>
</tr>
<tr>
<td>24-hour storage stability (max, %)</td>
<td>AASHTO T 59</td>
<td>1</td>
</tr>
<tr>
<td>Residue by evaporation (min, %)</td>
<td>California Test 331</td>
<td>63</td>
</tr>
</tbody>
</table>

Tests on residue from evaporation test:

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torsional recovery, measure entire arc of recovery at 25 °C (min, %)</td>
<td>California Test 332</td>
<td>40</td>
</tr>
<tr>
<td>Penetration at 25 °C (0.01 mm)</td>
<td>AASHTO T 49</td>
<td>70–150</td>
</tr>
</tbody>
</table>

a SFS means Saybolt Furol seconds

39-5.01B(3) Reserved

39-5.01C Construction

39-5.01C(1) General
Use method compaction for BWC.

Do not dilute the asphaltic emulsion.

Do not place BWC if rain is forecast for the project area within 24 hours by the National Weather Service.

39-5.01C(2) Spreading and Compacting Equipment
Use a material transfer vehicle when placing BWC.

Use an integrated distributor paver capable of spraying the asphaltic emulsion membrane, spreading the HMA, and leveling the mat surface in 1 pass.

Apply asphaltic emulsion membrane at a uniform rate for the full paving width. The asphaltic emulsion membrane must not be touched by any part of the paver including wheels or tracks.

If the spray bar is adjusted for changing pavement widths, the paver must prevent excess spraying of asphaltic emulsion beyond 2 inches of the HMA edge.

39-5.01C(3) Applying Asphaltic Emulsion

Before spreading HMA, apply asphaltic emulsion membrane on dry or damp pavement with no free water.

Apply emulsion at a temperature from 120 to 180 degrees F and in a single application at the residual rate specified for the condition of the underlying surface. Asphaltic emulsion membrane must have a target residual rate for the surfaces to receive the emulsion as shown in the following table:
Asphaltic Emulsion Membrane Target Residual Rate

<table>
<thead>
<tr>
<th>Surface to receive asphaltic emulsion membrane</th>
<th>Target residual rates (gal/sq yd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCC pavement</td>
<td>0.09–0.11</td>
</tr>
<tr>
<td>Dense, compacted, new HMA pavement</td>
<td>0.11–0.14</td>
</tr>
<tr>
<td>Open textured, dry, aged or oxidized existing AC pavement</td>
<td>0.13–0.17</td>
</tr>
</tbody>
</table>

If requested and authorized, you may change the asphaltic emulsion membrane application rates.

39-5.01C(4) Placing and Compacting Hot Mix Asphalt

Construct a transverse joint if the HMA remains in the paver for more than 30 minutes.

Do not reintroduce HMA spread over asphaltic emulsion membrane into the paving process.

Do not overlap or hot lap HMA. Pave through lanes after paving adjacent:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets
10. Ramps

For BWC placed on areas adjacent to through lanes that extend into the through lanes, cut the BWC to a neat, straight vertical line at the lane line.

If you spill asphaltic emulsion into the paver hopper, stop paving and remove the contaminated material.

39-5.01D Payment
Not Used

39-5.02 BONDED WEARING COURSES-GAP GRADED

39-5.02A General

39-5.02A(1) Summary

Section 39-5.02 includes specifications for producing bonded wearing course-gap graded.

39-5.02A(2) Definitions

Reserved

39-5.02A(3) Submittals

Include film thickness and calculations and AASHTO T 305 results with your JMF submittal.

39-5.02A(4) Quality Control and Assurance

39-5.02A(4)(a) General

Reserved

39-5.02A(4)(b) Quality Control

39-5.02A(4)(b)(i) General

Reserved

39-5.02A(4)(b)(ii) Aggregate

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:
### Aggregate Testing Frequencies

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradation</td>
<td>AASHTO T 27</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>Sand equivalent&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td>AASHTO T 176</td>
<td></td>
</tr>
<tr>
<td>Moisture content&lt;sup&gt;c&lt;/sup&gt;</td>
<td>AASHTO T 329</td>
<td>1 per 1500 tons and any remaining part</td>
</tr>
<tr>
<td>Crushed particles</td>
<td>AASHTO T 335</td>
<td></td>
</tr>
<tr>
<td>Los Angeles rattler</td>
<td>AASHTO T 96</td>
<td></td>
</tr>
<tr>
<td>Flat and elongated particles</td>
<td>ASTM D4791</td>
<td>1 per 10,000 tons or 2 per project, whichever is greater</td>
</tr>
<tr>
<td>Fine aggregate angularity</td>
<td>AASHTO T 304 Method A</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2, and 8.4.3 do not apply.

<sup>c</sup>Test at continuous mixing plants only.

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during BWC-G production.

**39-5.02A(4)(b)(iii) Hot Mix Asphalt Production**

Sample BWC in two 1-gallon metal containers.

Test the quality characteristics of BWC-G under the test methods and frequencies shown in the following table:

### BWC-G Testing Frequencies

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content</td>
<td>AASHTO T 308 Method A</td>
<td>1 per 750 tons and any remaining part</td>
</tr>
<tr>
<td>HMA moisture content</td>
<td>AASHTO T 329</td>
<td>1 per 2,500 tons but not less than 1 per paving day</td>
</tr>
</tbody>
</table>

**39-5.02A(4)(b)(iv)–39-5.02A(4)(b)(vii) Reserved**

**39-5.02A(4)(c) Department Acceptance**

The Department accepts BWC-G based on compliance with:

1. Asphalt binder content at JMF -0.4, +0.5 percent when tested under AASHTO T 308, Method A.
2. Aggregate quality requirements shown in the following table:
### Aggregate Quality

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation</td>
<td>AASHTO T 27</td>
<td>JMF ± Tolerance</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-fractured face</td>
<td>AASHTO T 335</td>
<td>--</td>
</tr>
<tr>
<td>Two-fractured faces</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td>Loss at 100 Rev.</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Los at 500 Rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand equivalent (min)</td>
<td>AASHTO T 176</td>
<td>47</td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight at 5:1)</td>
<td>ASTM D4791</td>
<td>25</td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %)</td>
<td>AASHTO T 304</td>
<td>45 Method A</td>
</tr>
</tbody>
</table>

*Reported value must be the average of 3 tests from a single sample.

*Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.

### 39-5.02B Materials
#### 39-5.02B(1) General
Reserved

#### 39-5.02B(2) Mix Design
For BWC-G, the 1st paragraph of section 39-1.02B(1) does not apply.

Determine the proposed OBC from a mix design that complies with the requirements shown in the following table:

### Hot Mix Asphalt Mix Design Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film thickness (min, μm)</td>
<td>Asphalt Institute MS-2 Table 6.1</td>
<td>12</td>
</tr>
<tr>
<td>Drain down (max, %)</td>
<td>AASHTO T 305 b</td>
<td>0.1</td>
</tr>
</tbody>
</table>

*Film thickness is calculated based on the effective asphalt content and determined as follows:

\[
FT = \left( \frac{P_{be}}{SA \times G_b \times 1000} \right) 10^6
\]

Where:
FT = Film thickness in \( \mu m \)

\( P_{be} \) = Effective asphalt content by total weight of mix using SP-2 Asphalt Mixture

SA = Estimated surface area of the aggregate blend in \( m^2/kg \) from Table 6.1 in the Asphalt Institute Manual Series No. 2 (MS-2).

\( G_b \) = Specific gravity of asphalt binder

b Combine aggregate and asphalt at the asphalt binder supplier's instructed mixing temperature. Coated aggregates that fall through the wire basket during loading must be returned to the basket before conditioning at 350 °F for 1 hour.

The OBC must be greater than 4.9 percent by total weight of mix.

39-5.02B(3) Asphalt Binder
Reserved

39-5.02B(4) Aggregate
The aggregate must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Quality</th>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of crushed particles</td>
<td>Coarse aggregate (min, %)</td>
<td>AASHTO T 335</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>One-fractured face</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Two-fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine aggregate (min, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Passing No. 4 sieve and retained on No. 8 sieve.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>One fractured face</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>Los Angeles Rattler (max, %)</td>
<td>Loss at 100 Rev.</td>
<td>AASHTO T 96</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Loss at 500 Rev.</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Sand equivalent (min)</td>
<td></td>
<td>AASHTO T 176</td>
<td>47</td>
</tr>
<tr>
<td>Flat and elongated particles (max, % by weight @ 5:1)</td>
<td></td>
<td>ASTM D4791</td>
<td>25</td>
</tr>
<tr>
<td>Fine aggregate angularity (min, %)</td>
<td>AASHTO T 304 Method A</td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

bReported value must be the average of 3 tests from a single sample.

bUse of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 4.8, 7.1.2, 8.4.2 and 8.4.3 do not apply.

The aggregate gradations for BWC-G must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Aggregate Gradation Requirements</th>
<th>BWC-G pavement thickness shown</th>
<th>Gradation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>less than 0.08 foot</td>
<td>No. 4 or 3/8 inch</td>
</tr>
<tr>
<td></td>
<td>0.08 foot or greater</td>
<td>1/2 inch</td>
</tr>
</tbody>
</table>

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:
### Aggregate Gradation (Percentage Passing)
**Bonded Wearing Course—Gap Graded**

<table>
<thead>
<tr>
<th>Sieve sizes</th>
<th>Target value limits</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>80–100</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>55–80</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td>25–40</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>19–32</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 16</td>
<td>16–22</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td>10–18</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 50</td>
<td>8–13</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 100</td>
<td>6–10</td>
<td>TV ± 2</td>
</tr>
<tr>
<td>No. 200</td>
<td>4.0–7.0</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sieve sizes</th>
<th>Target value limits</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>80–100</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td>25–40</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>19–32</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 16</td>
<td>16–22</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td>10–18</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 50</td>
<td>8–13</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 100</td>
<td>7–11</td>
<td>TV ± 2</td>
</tr>
<tr>
<td>No. 200</td>
<td>6.0–10.0</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sieve sizes</th>
<th>Target value limits</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>95–100</td>
<td>TV ± 2</td>
</tr>
<tr>
<td>No. 4</td>
<td>42–55</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>19–32</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 16</td>
<td>16–22</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td>10–18</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 50</td>
<td>8–13</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 100</td>
<td>7–11</td>
<td>TV ± 2</td>
</tr>
<tr>
<td>No. 200</td>
<td>6.0–10.0</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

#### 39-5.02C Construction

Apply asphaltic emulsion when the atmospheric and pavement temperatures are above:

1. 50 degrees F if PG 76-22 M is specified
2. 45 degrees F if PG 64-28 M is specified

#### 39-5.02D Payment

Not Used

#### 39-7 MINOR HOT MIX ASPHALT

#### 39-7.01 GENERAL

#### 39-7.01A Summary

Section 39-7 includes specifications for producing and placing minor hot mix asphalt.
Minor HMA must comply with section 39-2 except as specified in this section 39-7.

39-7.01B Definitions
Reserved

39-7.01C Submittals
The QC plan, test results, and inertial profiler specifications in sections 39-1.01C(3), 39-1.01C(4), 39-1.01C(13)(c)–(d) do not apply.

39-7.01D Quality Control and Assurance
39-7.01D(1) General
For minor HMA, the JMF renewal, inertial profiler certifications and testing, and prepaving meeting specifications in sections 39-1.01D(4), 39-1.01D(6)(c), and 39-1.01D(7) do not apply.

Test pavement smoothness with a 12 foot straightedge.

39-7.01D(2) Quality Control
For minor HMA, section 39-2.01D(2) applies except testing for compliance with the following quality characteristics is not required:

1. Flat and elongated particles
2. Fine aggregate angularity
3. Hamburg wheel track
4. Moisture susceptibility

39-7.01D(3) Department Acceptance
The Department accepts minor HMA under section 39-2.01D(5) except compliance with the following quality characteristics is not required:

1. Flat and elongated particles
2. Fine aggregate angularity
3. Hamburg wheel track
4. Moisture susceptibility

39-7.02 MATERIALS
39-7.02A General
Reserved

39-7.02B Mix Design
The mix design for minor HMA must comply with section 39-2.02B except the Hamburg wheel track and moisture susceptibility requirements do not apply.

39-7.02C Asphalt Binder
The grade of asphalt binder for minor HMA must be PG-64-10 or PG-64-16.

39-7.02D Liquid Antistrip Treatment
Treat minor HMA with liquid antistrip. Liquid antistrip treatment is not required if you submit AASHTO T 283 and AASHTO T 324 (Modified) test results showing compliance with section 39-2.02B. The tests must be dated within 12 months of submittal.

39-7.03 CONSTRUCTION
Not Used

39-7.04 PAYMENT
Not Used
42 GROOVE AND GRIND CONCRETE

Section 42-1 includes general specifications for grooving and grinding concrete.

Replace the headings and paragraphs in section 42-3 with:

42-3.01 GENERAL
42-3.01A Summary
Section 42-3 includes specifications for grinding the surfaces of pavement, bridge decks, and approach slabs.

42-3.01B Definitions
Reserved

42-3.01C Submittals
Reserved

42-3.01D Quality Control and Assurance
Reserved

42-3.02 MATERIALS
Not Used

42-3.03 CONSTRUCTION
42-3.03A General
Grind surfaces in the longitudinal direction of the traveled way and grind the full lane width. Begin and end grinding at lines perpendicular to the roadway centerline.

Grinding must result in a parallel corduroy texture with grooves from 0.08 to 0.12 inch wide and from 55 to 60 grooves per foot of width. Grooves must be from 0.06 to 0.08 inch from the top of the ridge to the bottom of the groove.

Grind with abrasive grinding equipment using diamond cutting blades mounted on a self-propelled machine designed for grinding and texturing concrete pavements.

42-3.03B Pavement
Grind existing concrete pavement that is adjacent to an individual slab replacement. Grind the replaced individual slab and all the existing slabs immediately surrounding it. Grind after the individual slab is replaced.

Grind existing concrete pavement that is adjacent to new lanes of concrete pavement. Grind before paving.

After grinding, the existing pavement must comply with requirements for smoothness and coefficient of friction in section 40 except:

1. At the midpoint of a joint or crack, test smoothness with a straightedge. Both sides must have uniform texture.
2. Straightedge and inertial profiler requirements do not apply to areas abnormally depressed from subsidence or other localized causes. End smoothness testing 15 feet before and resume 15 feet after these areas.
3. Cross-slope must be uniform and have positive drainage across the traveled way and shoulder.

As an alternative to grinding existing concrete pavement, you may replace the existing pavement. The new concrete pavement must be the same thickness as the removed pavement. Replace existing pavement between longitudinal joints or pavement edges and transverse joints. Do not remove portions of slabs.

Replacement of existing concrete pavement must comply with requirements for individual slab replacement in section 41-9.
42-3.03C Bridge Decks, Approach Slabs, and Approach Pavement

Grind bridge decks, approach slabs, and approach pavement only if described.

The following ground areas must comply with the specifications for smoothness and concrete cover over reinforcing steel in section 51-1.01D(4):

1. Bridge decks
2. Approach slabs
3. Adjacent 50 feet of approach pavement

After grinding, the coefficient of friction must comply with section 51-1.01D(4).

42-3.04 PAYMENT

Grinding existing approach slabs and adjacent 50 feet of approach pavement is paid for as grind existing bridge deck.

The Department does not pay for grinding replacement concrete pavement or for additional grinding to comply with smoothness requirements.

Add to section 42:

07-19-13

52 REINFORCEMENT

07-18-14

Add to section 52-1.01A:

07-20-12

Splicing of bar reinforcement must comply with section 52-6.

Replace the 1st and 2nd paragraphs of section 52-1.02B with:

10-19-12

Reinforcing bars must be deformed bars complying with ASTM A 706/A 706M, Grade 60, except you may use:

1. Deformed bars complying with ASTM A 615/A 615M, Grade 60, in:
   1.1. Junction structures
   1.2. Sign and signal foundations
   1.3. Minor structures
   1.4. Concrete crib members
   1.5. Mechanically-stabilized-embankment concrete panels
   1.6. Masonry block sound walls
2. Deformed or plain bars complying with ASTM A 615/A 615M, Grade 40 or 60, in:
   2.1. Slope and channel paving
   2.2. Concrete barriers Type 50 and 60
3. Plain bars for spiral or hoop reinforcement in structures and concrete piles

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

04-20-12

9. Shear reinforcement stirrups in PC girders

Replace the 9th paragraph of section 52-1.03D with:

07-18-14

Terminate each unit of spiral reinforcement at both ends by lapping the spiral reinforcement on itself for at least 80 diameters followed by (1) a 135-degree hook with a 6-inch tail hooked around an intersecting longitudinal bar or (2) a mechanical lap splice coupler. Discontinuities in spiral reinforcement may be made only where shown or authorized. The spiral on each side of a discontinuity or a lap splice is a separate unit. Where discontinuities in spiral reinforcement are not allowed, splice the spiral reinforcement. Lap splices in spiral reinforcement must be
lapped at least 80 diameters followed by (1) a 135-degree hook with a 6-inch tail hooked around an intersecting longitudinal bar or (2) a mechanical lap splice coupler.

**Add to section 52-5.01D:**

52-5.01D(4) Quality Assurance Testing
Secure, identify, and transport QA headed bar reinforcement test samples to METS as specified for splice test samples in section 52-5.01D(3)(b).

The Department tests headed bar reinforcement as specified for QC testing in section 52-5.01D(3)(b).

The Department will notify you of the QA test results for each bundle of 4 test samples of splices within 3 business days after METS receives the bundle unless more than 1 bundle is received on the same day, in which case allow 2 additional business days for each additional bundle received.

**Replace the 6th paragraph of section 52-6.01D(4)(a) with:**

Before performing service splice or ultimate butt splice testing, perform total slip testing on the service splice or ultimate butt splice test samples under section 52-6.01D(4)(b).

**Replace section 52-6.02D with:**

52-6.02D Ultimate Butt Splice Requirements
When tested under California Test 670, ultimate butt splice test samples must demonstrate necking as either of the following:

1. For "Necking (Option I)," the test sample must rupture in the reinforcing bar outside of the affected zone and show visible necking.
2. For "Necking (Option II)," the largest measured strain must be at least:
   2.1. Six percent for no. 11 and larger bars
   2.2. Nine percent for no. 10 and smaller bars

**Replace the 2nd and 3rd paragraphs of section 52-6.03B with:**

Do not splice the following by lapping:

1. No. 14 bars
2. No. 18 bars
3. Hoops
4. Reinforcing bars where you cannot provide a minimum clear distance of 2 inches between the splice and the nearest adjacent bar

56 SIGNS
07-19-13

**Replace the 4th paragraph of section 56-3.01A with:**

The types of sign structures include:

1. Truss
2. Bridge mounted
3. Tubular

**Replace "sets" in the 1st paragraph of section 56-3.01C(2) with:**

copies
Delete the 7th paragraph of section 56-3.02K(2).
Replace the 1st paragraph of section 56-3.02M(1) with:

Galvanize all ferrous metal parts of the following sign structure types:

1. Truss
2. Bridge mounted
3. Tubular

Add between the 1st and 2nd paragraphs of section 56-3.02M(1):

Clean and paint all ferrous metal parts of tubular sign structures after galvanizing, including the areas to be covered by sign panels. Do not paint sign structures other than tubular type unless specified in the special provisions.

Replace the headings and paragraphs in section 56-3.02M(3) with:

Where specified, clean and paint sign structures under section 59-5.

59 PAINTING

Replace "SSPC-SP 10" at each occurrence in section 59 with:

SSPC-SP 10/NACE no. 2

Replace "SSPC-SP 6" at each occurrence in section 59 with:

SSPC-SP 6/NACE no. 3

Replace "SSPC-CS 23.00" at each occurrence in section 59 with:

SSPC-CS 23.00/AWS C 2.23M/NACE no. 12

Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 1st paragraph of section 59-2.01C(1) with:

Specification for Structural Joints Using High-Strength Bolts

Replace "SSPC-QP 3 or AISC SPE, Certification P-1 Enclosed" in item 3 in the list in the 1st paragraph of section 59-2.01D(1) with:

AISC-420-10/SSPC-QP 3 (Enclosed Shop)

Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 1st paragraph of section 59-2.02 with:

Specification for Structural Joints Using High-Strength Bolts
Replace the paragraphs in section 59-2.03A with:

Clean and paint all exposed structural steel and other metal surfaces.

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

Except for blast cleaning within closed buildings, perform blast cleaning and painting during daylight hours.

Add to section 59-2.03B:

59-2.03B(3) Containment Systems

59-2.03B(3)(a) General
Construct containment systems when disturbing existing paint systems during bridge rehabilitation.

The containment system must be one of the following:

1. Ventilated containment system
2. Vacuum-shrouded surface preparation equipment and drapes and ground covers
3. Equivalent containment system if authorized

The containment system must contain all water, resulting debris, and visible dust produced when the existing paint system is disturbed.

Properly maintain the containment system while work is in progress and do not change the containment system unless authorized.

Containment systems over railroad property must provide the minimum clearances as specified in section 5-1.20C for the passage of railroad traffic.

59-2.03B(3)(b) Ventilated Containment Systems

59-2.03B(3)(b)(i) General
If flexible framing is used, support and fasten it to (1) prevent the escape of abrasive and blast materials due to whipping from traffic or wind and (2) maintain clearances.

If the wind speed reaches 50 mph or greater, relieve the wind pressure on the containment system using an authorized method.

59-2.03B(3)(b)(ii) Design Criteria
Scaffolding or supports for the ventilated containment system must not extend below the vertical clearance level nor to the ground line at locations within the roadbed.

For truss-type bridges, all connections of the ventilated containment system to the existing structure must be made through the deck, girder, stringer, or floor beam system. No connections are allowed that will cause bending stresses in a truss member.

The ventilated containment system must comply with section 7-1.02K(6)(e).

The minimum total design load for the ventilated containment system must consist of the sum of the dead and live vertical loads.

Dead and live loads are as follows:

1. Dead load must consist of the actual load of the ventilated containment system
2. Live loads for bridges with only spot blast cleaning work must consist of:
   2.1. Uniform load of at least 25 psf applied over the supported area
   2.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system
3. Live loads for bridges with 100 percent blast cleaning to bare metal must consist of:
   3.1. Uniform load of at least 45 psf, which includes 20 psf of sand load, applied over the supported area
3.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system.

Assumed horizontal loads do not need to be included in the design of the ventilated containment system.

Maximum allowable stresses must comply with section 48-2.01D(3)(c).

59-2.03B(3)(b)(iii) Ventilation

The ventilation system in the ventilated containment system must be of the forced input airflow type with fans or blowers.

Negative air pressure must be employed within the ventilated containment system and will be verified by visual methods by observing the concave nature of the ventilated containment system while taking into account wind effects or by using smoke or other visible means to observe airflow. The input airflow must be properly balanced with the exhaust capacity throughout the range of operations.

The exhaust airflow of the ventilation system in the ventilated containment system must be forced into wet or dry dust collectors or bag houses.

Replace item 1 in the list in the 2nd paragraph of section 59-2.03C(1) with:

1. Apply a stripe coat of undercoat paint on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. The stripe coat must completely hide the surface being covered. If spot blast cleaning portions of the bridge, apply the stripe coat of undercoat paint before each undercoat and follow with the undercoat as soon as practical. If removing all existing paint from the bridge, apply the undercoat first as soon as practical and follow with the stripe coat of undercoat paint for each undercoat.

Replace the heading of section 59-2.03C(2) with:

Zinc Coating System

Add to section 59-2.03C(2)(a):

Coatings for new structural steel and connections between new and existing structural steel must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Description</th>
<th>Coating</th>
<th>Dry film thickness (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All new surfaces:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undercoat</td>
<td>Inorganic zinc primer, AASHTO M 300 Type I or II</td>
<td>4–8</td>
</tr>
<tr>
<td>Finish coat(^a)</td>
<td>Exterior grade latex(^b), 2 coats</td>
<td>2 minimum each coat, 4–8 total</td>
</tr>
<tr>
<td>Total thickness, all coats</td>
<td></td>
<td>8–14</td>
</tr>
<tr>
<td>Connections to existing structural steel:(^c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undercoat</td>
<td>Inorganic zinc primer, AASHTO M 300 Type I or II</td>
<td>4–8</td>
</tr>
<tr>
<td>Finish coat(^a)</td>
<td>Exterior grade latex(^b), 2 coats</td>
<td>2 minimum each coat, 4–8 total</td>
</tr>
<tr>
<td>Total thickness, all coats</td>
<td></td>
<td>8–14</td>
</tr>
</tbody>
</table>

\(^a\)If no finish coats are described, a final coat of inorganic zinc primer is required.

\(^b\)Exterior grade latex must comply with section 91-2.02 unless otherwise specified.

\(^c\)Includes the following locations:
1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or
Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 7th paragraph of section 59-2.03C(2)(b)(i) with:

"Specification for Structural Joints Using High-Strength Bolts"

Add to section 59-2.03C:

59-2.03C(3) Moisture-Cured Polyurethane Coating System
Reserved

59-2.03C(4) State Specification Paint Waterborne Coating System

59-2.03C(4)(a) General
The State Specification PWB coating system for existing structural steel must comply with the requirements shown in the following table:

<table>
<thead>
<tr>
<th>Surface</th>
<th>Description</th>
<th>State Specification PWB Coating</th>
<th>Dry film thickness (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaces cleaned to bare metal*</td>
<td>1st undercoat</td>
<td>145</td>
<td>2–3</td>
</tr>
<tr>
<td></td>
<td>2nd undercoat</td>
<td>146</td>
<td>2–3</td>
</tr>
<tr>
<td></td>
<td>1st finish coat</td>
<td>171</td>
<td>1.5–3</td>
</tr>
<tr>
<td></td>
<td>2nd finish coat</td>
<td>172</td>
<td>1.5–3</td>
</tr>
<tr>
<td></td>
<td>Total thickness, all coats</td>
<td>--</td>
<td>7–12</td>
</tr>
</tbody>
</table>

| Existing painted surfaces to be topcoated: |  Undercoat     | 146                             | 2–3                       |
|                                           | 1st finish coat| 171                             | 1.5–3                     |
|                                           | 2nd finish coat| 172                             | 1.5–3                     |
|                                           | Total thickness, new coats | --                              | 5–9                       |

*Includes locations of spot blast cleaning

59-2.03C(4)(b) Finish Coats
Reserved

Add to section 59-5.01:

Where specified, prepare and paint sign structures under sections 59-2 and 59-3.

Instead of submitting proof of the certification complying with SSPC-QP 1, you may submit documentation with the painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1.

Instead of submitting proof of the certification complying with SSPC-QP 2, you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 4.2 through 4.4 of SSPC-QP 2, Category A.

Instead of submitting proof of the certification complying with AISC-420-10/SSPC-QP 3 (Enclosed Shop), you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP3.
Replace the paragraphs of section 59-5.03 with:

59-5.03A General
You may prepare and paint sign structures before or after erection. After erection, repair damaged paint to the satisfaction of the Engineer.

The total dry film thickness of finish coats on contact surfaces of galvanized HS bolted connections (1) must be from 1 to 4 mils and (2) may be applied in 1 application.

59-5.03B Undercoating of Ungalvanized Surfaces
Blast-cleaned surfaces must receive a single undercoat consisting of an inorganic zinc coating as specified in AASHTO M 300, Type I or Type II, except:

1. The first 2 sentences of section 5.6 do not apply
2. Section 5.6.1 does not apply

If you propose to use a coating that is not on the Authorized Material List, submit the required documentation specified in section 5.6 of AASHTO M 300. Allow 30 days for the Engineer's review.

59-5.03C Testing of Inorganic Zinc Coating
Perform adhesion and hardness testing no sooner than 72 hours after application of the single undercoat of inorganic zinc coating.

59-5.03D Finish Coating
The exposed area of inorganic zinc coating must receive a minimum of 2 finish coats of exterior grade latex paint.

The 1st finish coat color must match no. 24558 of FED-STD-595. The 2nd finish coat color must match no. 24491 of FED-STD-595. The total dry film thickness of the applications of the 2nd finish coat must be not less than 2 mils.

Replace section 59-7 with:

59-7 STAINING CONCRETE AND SHOTCRETE

59-7.01 GENERAL
59-7.01A General
59-7.01A(1) Summary
Section 59-7.01 includes specifications for preparing and staining concrete and shotcrete surfaces using an acid stain.

59-7.01A(2) Definitions
Reserved

59-7.01A(3) Submittals
Submit stain manufacturer's product data and application instructions at least 7 days before starting staining activities.

59-7.01A(4) Quality Control and Assurance
Reserved

59-7.01B Materials
59-7.01B(1) General
Reserved

59-7.01B(2) Stain
Stain must:

1. Be a water-based solution of inorganic metallic salts
2. Contain dilute acid that penetrates and etches the concrete or shotcrete surface
3. Be a commercial quality product designed specifically for exterior applications
4. Produce abrasion-resistant color deposits

59-7.01B(3) Sealer
Reserved

59-7.01B(4) Joint Sealing Compound
Reserved

59-7.01C Construction
59-7.01C(1) General
Seal joints between concrete and shotcrete surfaces to be stained and adjacent metal with joint sealing compound before applying the stain.

Test surfaces for acceptance of the stain before applying the stain. Clean surfaces that resist accepting the stain and retest until passing.

Apply the stain under the manufacturer's instructions.

Before staining, the concrete or shotcrete surfaces must be:
1. At least 28 days old
2. Prepared under SSPC-SP 13/NACE no. 6
3. Thoroughly dry

Apply the stain uniformly to avoid excessive rundown. Work the stain into the concrete using a nylon bristle brush in a circular motion.

After the last coat of stain has dried, rinse stained surfaces with water and wet scrub with a stiff bristle nylon brush until the rinse water runs clear. Collect all rinse water.

Protect adjacent surfaces during staining.

Thoroughly cure each application of the stain and correct skips, holidays, thin areas, or other deficiencies before the next application.

Drips, puddles, or other irregularities must be worked into the concrete or shotcrete surface.

59-7.01C(2) Test Panel
For staining concrete or shotcrete, stain a test panel complying with section 51-1.01D(3).

For staining sculpted shotcrete, stain a test panel complying with section 53-3.01D(3).

The test panel must be:
1. Stained using the same personnel, materials, equipment and methods to be used in the work
2. Accessible for viewing
3. Displayed in an upright position near the work
4. Authorized for staining before starting the staining work

If ordered, construct additional test panels until a satisfactory color is attained.

The Engineer uses the authorized stained test panel to determine the acceptability of the stained surface.

Dispose of the test panels after the staining work is complete and authorized. Notify the Engineer before disposing of the test panels.

59-7.01D Payment
Not Used
59-7.02 SCULPTED SHOTCRETE AND TEXTURED CONCRETE

59-7.02A General

59-7.02A(1) Summary
Section 59-7.02 includes specifications for preparing and staining sculpted shotcrete and textured concrete surfaces using an acid stain.

59-7.02A(2) Definitions
Reserved

59-7.02A(3) Submittals
59-7.02A(3)(a) General
Reserved

59-7.02A(3)(b) Experience Qualifications
Submit the following documentation of the staining subcontractor's experience at least 10 days before the preconstruction meeting:

1. Summary of the staining subcontractor's experience that demonstrates compliance with section 59-7.02A(4)(b).
2. List of at least 3 projects completed in the last 5 years that demonstrate the staining subcontractor's ability to stain textured concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project. For each project include:
   2.1. Project description
   2.2. Name and phone number of the owner
   2.3. Staining completion date
   2.4. Color photos of the completed stained surface

59-7.02A(3)(c) Installation Plan
Submit an installation plan at least 10 days before the preconstruction meeting. The installation plan must include details for preparing and staining the textured concrete or sculpted shotcrete to achieve the required color, including:

1. Number of applications that will be used to apply the stain
2. For each application of the stain, a description of:
   2.1. Manufacturer, color, finish, and percentage strength mixture of the stain that will be applied
   2.2. Methods and tools that will be used to apply the stain
3. Methods for protecting adjacent surfaces during staining
4. Rinse water collection plan for containing all liquid, effluent, and residue resulting from preparing and staining textured concrete or sculpted shotcrete

59-7.02A(4) Quality Control and Assurance
59-7.02A(4)(a) General
Reserved

59-7.02A(4)(b) Contractor Qualifications
The staining subcontractor must:

1. Have experience in staining textured concrete or sculpted shotcrete surfaces to simulate the appearance of natural rock formations or stone masonry
2. Have successfully completed at least 3 projects in the past 5 years involving staining of concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project

59-7.02A(4)(c) Preconstruction Meeting
Before starting staining activities, conduct a meeting to discuss the installation plan. Meeting attendees must include the Engineer and all staining subcontractors.

59-7.02B Materials
Not Used
59-7.02C Construction
Not Used

59-7.02D Payment
Prepare and stain concrete and prepare and stain shotcrete are measured by the area of the vertical or sloped wall face stained.

Replace "solider" in the 5th paragraph of section 59-9.03 with:

soldier

Replace section 59-11 with:

07-19-13

59-11 STAINING GALVANIZED SURFACES

Reserved

Replace section 59-12 with:

07-19-13

59-12 ROCK STAINING

59-12.01 GENERAL
59-12.01A Summary
Section 59-12 includes specifications for applying stain to the exterior surface of landscape boulders, native rock that has been damaged or scarred, rock energy dissipaters, rock slope protection and gabion surfaces.

59-12.01B Submittals
Submit the following:
1. Work plan showing methods to control overspray and spillage, and to protect adjacent surfaces
2. Product data including the manufacturer's product sheet and the instructions for the application of the stain

59-12.01C Quality Control and Assurance
59-12.01C(1) General
Reserved

59-12.01C(2) Test Plot
Apply the stain to a test plot rock area of at least 3 by 3 feet at a location designated by the Engineer. Notify the Engineer at least 7 days before staining the test plot. Prepare and stain the test plot with the same materials, tools, equipment, and methods to be used in staining the final surfaces. Separate test plots are required for staining rock slope protection and native rock.

If ordered, prepare additional test plots. Additional test plots are change order work.

Obtain authorization of the test plot before starting the staining work. Use the authorized test plot as the standard for comparison in determining acceptability of staining. If the test plot is not incorporated into the work and the Engineer determines it is no longer needed, dispose of it.

59-12.02 MATERIALS
59-12.02A General
Reserved

59-12.02B Stain
Reserved

59-12.03 CONSTRUCTION
59-12.03A General
Reserved
59-12.03B Preparation
Before applying the stain:

1. Identify and obtain authorization for the areas to be stained
2. Remove oils, dirt, and other contaminants from the surfaces to be stained
3. Dry all surfaces to be stained

59-12.03C Application
After the areas to be stained have been identified, prepared, and the test plot authorized, stain the exposed surfaces under the manufacturer's instructions to achieve a color consistent with, or as close as possible to, the authorized test area color.

Control overspray and protect adjacent surfaces.

Keep stained surfaces dry for at least 20 days following the application of the stain.

59-12.04 PAYMENT
Rock stain areas are measured along the slope face.

70 MISCELLANEOUS DRAINAGE FACILITIES

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

Replace "40-1.03N" in item 2.4 of the 1st paragraph of section 70-5.06C with:

40-1.03K

Replace the 2nd, 3rd, and 4th paragraphs of section 70-7.02B with:

Before shipping, the exterior surfaces of the casing must be cleaned, primed, and coated to comply with ANSI/AWWA C213 or ANSI/AWWA C214.

Wrapping tape for repairing damaged coating and wrapping field joints and fittings must be a pressure-sensitive PVC or polyethylene tape with a minimum thickness of 50 mils, 2 inches wide.

Add to section 70-7.03:

Repair damaged coating on the casing and wrap field joints and fittings with wrapping tape as follows:

1. Before wrapping, thoroughly clean and prime the pipe casing, joints, and fittings under the tape manufacturer's instructions.
2. Wrap the tape tightly with 1/2 uniform lap, free from wrinkles and voids to provide not less than a 100-mil thickness.
3. Wrapping at joints must extend at least 6 inches over adjacent pipe casing coverings. Apply tension such that the tape will conform closely to contours of the joint.
Add to section 70:

70-8–70-15 RESERVED

DIVISION VIII  MISCELLANEOUS CONSTRUCTION

72  SLOPE PROTECTION

11-15-13

Replace the table in the 3rd paragraph of section 72-2.02A with:

<table>
<thead>
<tr>
<th>Property</th>
<th>California Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent specific gravity</td>
<td>206</td>
<td>2.5 minimum</td>
</tr>
<tr>
<td>Absorption</td>
<td>206</td>
<td>4.2% maximum</td>
</tr>
<tr>
<td>Durability Index</td>
<td>229</td>
<td>52 minimum</td>
</tr>
</tbody>
</table>

Notes:
Durability absorption ratio (DAR) = course durability index/(% absorption + 1)
If the DAR is greater than 10, the absorption may exceed 4.2%
If the DAR is greater than 24, the durability index may be less than 52

Replace the row under "Class" in the table in the 1st paragraph of section 72-3.02B with:

| 1/2 T | 1/4 T | Light | Facing | Cobble |

Replace the table in the 2nd paragraph of section 72-3.02B with:

<table>
<thead>
<tr>
<th>Property</th>
<th>California Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent specific gravity</td>
<td>206</td>
<td>2.5 minimum</td>
</tr>
<tr>
<td>Absorption</td>
<td>206</td>
<td>4.2% maximum</td>
</tr>
<tr>
<td>Durability index</td>
<td>229</td>
<td>52 minimum</td>
</tr>
</tbody>
</table>

Notes:
Durability absorption ratio (DAR) = course durability index/(% absorption + 1)
If the DAR is greater than 10, the absorption may exceed 4.2%
If the DAR is greater than 24, the durability index may be less than 52

Replace the row under "Rock class" in the table in the 2nd paragraph of section 72-3.03E with:

| 1/2 T | 1/4 T | Light | Facing | Cobble |

Delete the 5th and 6th paragraphs of section 72-11.01B.

Add to section 72-11.01B:

Expanded polystyrene and premolded expansion joint filler must comply with section 51-2.
Delete the 2nd paragraph of section 72-11.01C(1).

Delete the 7th paragraph of section 72-11.01C(1).

Add between the 7th and 8th paragraphs of section 72-11.01C(1):

Schedule the construction of the slope paving such that the work, including placing and finishing concrete and applying curing compound, is completed on the same day that the work is started.

Replace the 8th paragraph of section 72-11.01C(1) with:

If the Engineer determines that the size of the slope paving is too large to be constructed without an intermediate construction joint, place a joint at an authorized location. Complete a section of concrete bounded by permissible construction joints within the same day.

Replace the 1st paragraph of section 72-11.01C(2) with:

Construct and finish minor concrete slope paving under section 51-1.

Replace the 3rd paragraph of section 72-11.01C(2) with:

After striking-off to grade, hand float the concrete with floats that are at least 4 inches wide and 30 inches long. Broom the entire surface with a stiff-bristled broom to produce a uniform surface. Brooming must be done when the surface is sufficiently set to prevent deep scarring and must be accomplished by drawing the broom down the slope, leaving marks parallel to the slope. The Engineer may order you to apply a fine spray of water to the surface immediately before brooming.

Delete the 3rd paragraph of section 72-11.01D.

73 CONCRETE CURBS AND SIDEWALKS

Replace the paragraph in section 73-1.01A with:

Section 73-1 includes general specifications for constructing minor concrete items including concrete curbs, sidewalks, gutter depressions, driveways, island paving, and curb ramps; for installing detectable warning surfaces and precast parking bumpers; and for texturing and coloring concrete surfaces.

75 MISCELLANEOUS METAL

Add between 2nd and 3rd paragraphs of section 75-1.03A:

Fabricate expansion joint armor from steel plates, angles, or other structural shapes. Shape the armor to the section of the concrete deck and match-mark it in the shop. Straighten warped sections of expansion joint armor before placing. Secure the expansion joint armor in the correct position during concrete placement.

Replace "SSPC-QP 3" in the 3rd paragraph of section 75-1.03E(4) with:

AISC-420-10/SSPC-QP3
Replace "metal beam guard railing" in the table in the 1st paragraph of section 75-1.05 with:
guardrail

Replace section 78 with:

78  INCIDENTAL CONSTRUCTION

78-1  GENERAL
Section 78 includes specifications for incidental bid items that are not closely associated with other sections.

78-2–78-50  RESERVED

DIVISION IX  TRAFFIC CONTROL FACILITIES

83  RAILINGS AND BARRIERS

Replace "metal beam guard railing" at each occurrence in sections 83-1.02 and 83-1.03 with:
midwest guardrail system

Replace "guard rail" and "guard railing" at each occurrence in sections 83-1.02A and 83-1.02B with:
guardrail

Replace the heading of section 83-1.02B with:
Midwest Guardrail System

Add between "splices at" and "posts" in the 5th paragraph of section 83-1.02B:
midspan between

Replace "Metal rail posts, box spacers, and" in item 1 in the list in the 25th paragraph of section 83-1.02B with:

Metal box spacers and

Replace item 4 in the list in the 25th paragraph of section 83-1.02B with:

4. For the connection of guard railing to new bridge railing or barriers, anchor bolt holes must be drilled in the concrete parapet or formed using metal or PVC sleeves.

Delete items 6 and 7 in the list in the 25th paragraph of section 83-1.02B.

Replace "Type WB" at each occurrence in section 83-1.02B(2) with:

Type WB-31

Replace the heading of section 83-1.02B(3) with:
Temporary Midwest Guardrail System

Replace the 2nd sentence of the 9th paragraph of section 83-1.02D(1) with:

Posts and balusters must be normal to the profile grade. Transverse to the profile grade, railings must be plumb within a tolerance not to exceed 0.02 foot in 10 feet.

Replace "80-2.02" in the 2nd paragraph of section 83-1.02E with:

80-3.02B

Replace the 3rd paragraph of section 83-1.02G(2) with:

Stud bolts must comply with the specifications for studs in clause 7 of AWS D1.1.

Replace "horizontal" in the 8th paragraph of section 83-1.02G(2) with:

vertical

Replace "sets" in the 10th paragraph of section 83-1.02G(2) with:

copies

Replace the 1st sentence of the 1st paragraph of section 83-1.03 with:

Except for guardrail within the pay limits of a terminal system, a transition railing (Type WB-31), an end anchor assembly, or a rail tensioning assembly, midwest guardrail system is measured along the face of the rail element from end post to end post of the completed railing.

Add to section 83-2.02D(1):

For a concrete barrier transition:

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

Add to section 83-2.02:

83-2.02H–83-2.02M Reserved

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-1.01C Submittals

For glass beads used in drop-on applications and in thermoplastic formulations, submit a certificate of compliance and test results for each lot of beads specifying the EPA test methods used and tracing the lot to the specific test sample. The testing for lead and arsenic content must be performed by an independent testing laboratory.

Submit retroreflectivity readings for traffic stripes and pavement markings at locations with deficient retroreflectivity determined by the Engineer.

84-1.01D Quality Control and Assurance

Test each lot of glass beads for arsenic and lead under EPA Test Method 3052 and 6010B or 6010C.

Applied traffic stripes and pavement markings must be retroreflective. Within 30 days of applying traffic stripes and pavement markings, the retroreflectivity of the stripes and markings must be a minimum of 250 mcd·m⁻²·lx⁻¹ for white and 125 mcd·m⁻²·lx⁻¹ for yellow when measured under ASTM E1710.
The Engineer will perform a nighttime, drive-through, visual inspection of the retroreflectivity of the traffic stripes and pavement markings and notify you of any locations with deficient retroreflectivity. Measure the retroreflectivity of the deficient areas using a retroreflectometer under ASTM E1710 and the sampling protocol specified in ASTM D7585.

Replace the paragraph in section 84-1.02 with:

Glass beads applied to paint must comply with State Specification 8010-004.
Glass beads applied to molten thermoplastic material must be Type 2 beads complying with AASHTO M 247. The glass beads must have a coating that promotes adhesion of the beads to thermoplastic.
At least 75 percent of the beads by count must be true spheres that are colorless and do not exhibit dark spots, air inclusions, or surface scratches when viewed under 20X magnification.
Each lot of glass beads used in pavement markings must contain less than 200 ppm each of arsenic and lead when tested under EPA Test Method 3052 and 6010B or 6010C.

Replace the 1st paragraph in section 84-2.04 with:

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

Add to section 84:

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

84-7–84-10 RESERVED

86 ELECTRICAL SYSTEMS
10-17-14
Replace the paragraphs in section 86-1.01 with:

Section 86 includes general specifications for constructing and rehabilitating electrical systems.
Electrical systems must comply with the material and installation specifications in section 86-2.
Section 86-3 includes specifications for constructing controller assemblies.
Section 86-4 includes specifications for constructing traffic signal faces, programmed visibility signal faces, pedestrian signal faces, flashing beacons, ramp metering signs, and signal mounting assemblies.
Section 86-5 includes specifications for constructing vehicle detectors and pedestrian push button assemblies.
Section 86-6 includes specifications for constructing lighting systems.
Section 86-7 includes specifications for constructing rehabilitating electrical equipment.
Comply with Part 4 of the California MUTCD. Nothing in section 86 is to be construed as to reduce the minimum standards in this manual.
The locations shown for electrical systems are approximate; the Engineer determines the final locations.
Replace the paragraphs in section 86-1.015 with:

actuation: Actuation as defined in the California MUTCD.
channel: Discrete information path.
controller assembly: Assembly for controlling a system's operations, consisting of a controller unit and auxiliary equipment housed in a rainproof cabinet.
controller unit: Part of the controller assembly performing the basic timing and logic functions.
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.
inductive loop detector: Detector capable of being actuated by an inductance change caused by a vehicle passing or standing over the loop.
lighting standard: Pole and mast arm supporting the luminaire.
luminaire: Assembly that houses the light source and controls the light emitted from the light source.
magnetic detector: Detector capable of being actuated by an induced voltage caused by a vehicle passing through the earth's magnetic field.
powder coating: Coating applied electrostatically using exterior-grade UV-stable polymer powder.
pretimed controller assembly: Assembly operating traffic signals under a predetermined cycle length.
pull box: A box with a cover that is installed in an accessible place in a run of conduit to facilitate the pulling in of wires or cables.
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 and mast arm supporting 1 or more signal faces with or without a luminaire mast arm.
traffic-actuated controller assembly: Assembly for operating traffic signals under the varying demands of traffic as registered by detector actuation.
traffic phase: Signal phase as defined in the California MUTCD.
vehicle: Vehicle as defined in the California Vehicle Code.

Replace the paragraphs in section 86-1.02 with:

Comply with 8 CA Code of Regs § 2299 et seq.

Electrical equipment must comply with one or more of the following standards:

1. ANSI
2. ASTM
3. EIA
4. NEMA
5. NETA
6. UL
Materials and workmanship must comply with:

1. FCC rules
2. ITE standards
3. NEC
4. California Electrical Code

Electrical equipment and materials must be NRTL certified wherever applicable.

Replace the paragraphs in section 86-1.03 with:

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

Determine the quantities required to complete the work. Submit the quantities as part of the schedule of values.

Provide a schedule of values for each lump sum bid item.

Do not include costs for the traffic control system in the schedule of values.

The schedule of values must include the type, size, and installation method for:

1. Foundations
2. Standards and poles
3. Conduit
4. Pull boxes
5. Conductors and cables
6. Service equipment enclosures
7. Telephone demarcation cabinets
8. Vehicle signal heads and hardware
9. Pedestrian signal heads and hardware
10. Push buttons
11. Loop detectors
12. Luminaires and lighting fixtures
13. Materials shown in the quantity tables on plan sheets labeled E

Replace the paragraphs in section 86-1.04 with:

Within 15 days of Contract approval, submit a list of equipment and materials that you propose to install. Submit the list before shipping equipment or materials to the job site. The list must include the following information:

1. Manufacturer's name
2. Make and model number
3. Month and year of manufacture
4. Lot and serial numbers
5. Dimensions
6. List of components
7. Manufacturer's installation instructions
8. Contract number
9. Your contact information

Supplement the list with 2 copies of the following data:

1. Schematic wiring diagrams
2. Scale drawings of cabinets showing location and spacing of shelves, terminal blocks, and equipment, including dimensions
3. Operation manual
Electrical equipment constructed as shown does not require detailed drawings and diagrams.
Submit 3 sets of computer-generated schematic wiring diagrams for the cabinet.
Place the schematic wiring diagram in a heavy-duty plastic envelope and attach it to the inside of the cabinet door.
Prepare diagrams, plans, and drawings using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

Replace the 5th paragraph of section 86-2.04B(2) with:
HS bolts, nuts, and flat washers used to connect slip base plates must comply with the requirements for HS fastener assemblies for use in structural steel joints in section 55-1.02A(1) except rotational capacity testing and tension testing are not required.

Delete the row for standard Type 36-20A in the table in the 6th paragraph of section 86-2.04B(2).
Replace the 10th paragraph of section 86-2.04B(2) with:
Bolted connections attaching signal or luminaire arm to the pole must be considered slip critical. Galvanized faying surfaces of plates on luminaire arm, signal arm, and pole must be roughened by hand using a wire brush before assembly and must comply with requirements for Class C surface conditions for slip-critical connections in Specification for Structural Joints Using High-Strength Bolts of the RCSC. Coatings for faying surfaces must comply with the RCSC specification for Class B coatings.

Replace the 1st sentence of item 8 in the list in the 1st paragraph of section 86-2.04B(3) with:
During manufacturing, longitudinal seams on vertical tubular members of cantilevered support structures must be within 90 degrees circumferentially of the center of the longest mast arm connection.

Delete item 15.3 in the list in the 1st paragraph of section 86-2.04B(3).

Add between "Exposed" and "conduit" in the 2nd paragraph of section 86-2.05B:
Type 1

Replace the 1st sentence of the 10th paragraph of section 86-2.05C with:
After installing conduit, install the pull tape.

Replace the 1st sentence of the 15th paragraph of section 86-2.05C with:
Conduit runs shown to be located behind curbs may be installed in the street within 3 feet of and parallel to the face of the curb by the trenching in pavement method.

Replace the 1st and 2nd sentences of the 2nd paragraph of section 86-2.05D with:
Install an expansion-deflection fitting for expansion joints 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.
Replace section 86-2.06 with:

86-2.06 PULL BOXES
86-2.06A General
86-2.06A(1) Cover Marking
The cover marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of the cover.

Marking letters must be 1 to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4-inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4-inch stainless steel rivets or 1/4-inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover such that the letters are raised a minimum of 3/32 inch.

86-2.06A(2) Installation and Use
Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of the pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place grout over the layer of roofing paper. Grout must be 0.50 to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in the center of the pull box through the grout and roofing paper.
5. Place grout between the pull box and the pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

86-2.06B Non–Traffic Pull Boxes
Reserved

86-2.06C Traffic Pull Boxes
The traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20 loading. You must be able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

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

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

After installation of traffic pull box, install the steel cover and keep it bolted down when your activities are not in progress at the pull box. When the steel cover is placed for the final time, the cover and Z bar frame must be cleaned of debris and tightened securely.
Steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must not exceed more than 1/8 inch above the top of the cover.

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

Replace the 11th row in the table in the 1st paragraph of section 86-2.08B with:

<table>
<thead>
<tr>
<th>Grounded circuit conductor</th>
<th>Pedestrian push buttons</th>
<th>Wht</th>
<th>Blk</th>
<th>NBR</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signals and multiple lighting</td>
<td>Wht</td>
<td>None</td>
<td>NBR</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Flashing beacons and sign lighting</td>
<td>Wht</td>
<td>None</td>
<td>NBR</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Lighting control</td>
<td>Wht</td>
<td>None</td>
<td>C-3</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>Wht</td>
<td>None</td>
<td>NBR</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

Replace the 1st sentence of the 1st paragraph of section 86-2.08C with:

Circuit conductors, connectors, and terminals must be UL or NRTL listed and rated for 600 V(ac) operation.

Add to the beginning of section 86-2.09A:

Provide enough traffic signal light conductors for functional operation of the signal. Provide 3 spare conductors in all conduits containing traffic signal light conductors.

Replace the paragraphs in section 86-2.09C with:

Connectors must be crimp type. Use a manufacturer-recommended tool for connectors and terminals to join conductors. Comply with SAE-AS7928.

Terminate stranded conductors smaller than no. 14 in crimp style terminal lugs.

Terminate field conductors no. 12 and smaller with spade type terminals. Terminate field conductors no. 10 and larger with spade type or ring type terminals.

Replace the value for resistivity in the table in the 6th paragraph of section 86-2.09E with:

25 x 10^{13} \, \Omega \text{ per inch, minimum}

Add between "the" and "head" in the 3rd sentence of the 2nd paragraph of 86-2.09F:

connector

Replace "project" in the 3rd paragraph of section 86-2.11A with:

work

Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:

work

Delete the 12th paragraph of section 86-2.11A.

Replace section 86-2.11C with:

86-2.11C  Electrical Service for Booster Pumps

Provide electrical service from the service point to the booster pump.
Furnish conductors, conduit, and pull boxes from the service point to the booster pump.

Do not use Type 3 conduit unless shown otherwise.

**Replace section 86-2.14A with:**

**86-2.14A General**

Deliver material and equipment for acceptance testing to either METS or a testing location as ordered.

Allow 30 days for testing. The Department notifies you when testing is complete. You must pick up the material or equipment from the test site and deliver it to the job site.

If material or equipment is rejected, allow 30 days for retesting. The retesting period starts when replacement material or equipment is delivered to the test site.

If material or equipment submitted for testing does not comply with the specifications, remove it within 5 business days after you are notified that the equipment is rejected. If equipment is not removed within that period, the Department may ship it to you and deduct the shipping cost.

Testing and quality control procedures for traffic signal controller assemblies must comply with NEMA TS standards for traffic control systems.

**Replace the 2nd paragraph of section 86-3.02A(1) with:**

The Department furnishes the BBS components under section 6-2.03.

**Replace the 9th paragraph of section 86-3.02B with:**

The couplings between the external cabinet and Model 332L cabinet must include a conduit for power connections between the 2 cabinets. Couplings must include:

1. 2-inch nylon-insulated steel chase nipple
2. 2-inch sealing steel locknut
3. 2-inch nylon-insulated steel bushing

**Delete item 1.3 in the list in the 7th paragraph of section 86-3.04A.**

**Replace the 2nd paragraph of section 86-4.01A with:**

The housing must not fail structurally as described in the following table:

<table>
<thead>
<tr>
<th>Housing type</th>
<th>Test method</th>
<th>Description of structural failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>California Test 666</td>
<td>Fracture within the housing assembly or deflection of more than half the lens diameter of the signal section during the wind load test</td>
</tr>
<tr>
<td>Plastic</td>
<td>California Test 605</td>
<td>Fracture within the housing assembly or deflection of 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 deflection of 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</td>
</tr>
</tbody>
</table>

Each metal housing must have a metal visor.
Replace the 1st sentence of section 86-4.01A(2) with:

Each plastic housing must be molded in 1 piece or fabricated from 2 or more pieces and joined into a single piece.

Delete item 1 in the list in section 86-4.01D(1)(b).

Replace the paragraphs in section 86-4.01D(1)(c)(i) with:

LED signal modules must be on the Authorized Material List for LED traffic signals.
The Department tests modules under section 86-2.14A, ANSI/ASQ Z1.4, and:
1. California Test 604 for LED and circular LED signal modules
2. California Test 3001 for arrow, U-turn, and bicycle LED signal modules

The LED signal modules submitted for testing must be typical production units. LEDs must be spread evenly across the module.
The Department may test the modules on all parameters specified in section 86-4.01D.

Replace the 1st and 2nd sentences of the 3rd paragraph of 86-4.01D(2)(b) with:

The electrical connection for each flashing LED signal module must be 4 secured, color-coded, jacketed copper wires. The wire must comply with the NEC.

Replace the heading of section 86-4.02 with:

PROGRAMMED VISIBILITY VEHICLE SIGNAL SECTION

Replace "face" in the 1st paragraph of section 86-4.02 with:

section

Add before the 1st sentence in section 86-4.03A:

The pedestrian signal face must be Type A.

Replace the 1st sentence of the 2nd paragraph of section 86-4.03B with:

The Department tests the pedestrian signal's front screen in a horizontal position with its edges supported.

Delete items 1 and 4 in the list in section 86-4.03I(1)(b).

Replace the paragraphs of section 86-4.03I(1)(c)(i) with:

The LED PSF module must be on the Authorized Material List for LED traffic signals.
The Department tests LED PSF modules under section 86-2.14A, ANSI/ASQ Z1.4, and California Test 606.
The LED PSF modules submitted for testing must be representative of typical production units.
The Department may test the modules on all parameters specified in section 86-4.03I.
Replace item 1 in the list in the 1st paragraph of section 86-4.03I(2) with:

1. Not include reflectors.

Replace item 6 in the list in the 1st paragraph of section 86-4.03I(2) with:

6. Be able to replace signal lamp optical units and pedestrian signal faces with LEDs.

Replace the table titled "Chromaticity Standards (CIE Chart)" in the 16th paragraph of section 86-4.03I(2) with:

<table>
<thead>
<tr>
<th>Chromaticity Standards (CIE Chart)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upraised hand</td>
</tr>
<tr>
<td>X: not greater than 0.659 or less than 0.600</td>
</tr>
<tr>
<td>Y: not greater than 0.390 or less than 0.331</td>
</tr>
<tr>
<td>Y = 0.990-X</td>
</tr>
<tr>
<td>Walking person</td>
</tr>
<tr>
<td>X: not greater than 0.440 or less than 0.280</td>
</tr>
<tr>
<td>Y: not greater than 0.0483 + 0.7917(X) or less than 0.0983 + 0.7917(X)</td>
</tr>
</tbody>
</table>

Replace the paragraphs in section 86-4.03J with:

Reserved

Add between "beacon" and "must" in the 1st sentence of section 86-4.05:

signal face

Delete "face" in item 1 in the list in the 1st paragraph of section 86-4.05.

Replace the row for viscosity in the table in the 2nd paragraph of section 86-5.01A(3)(c) with:

| Viscosity, Brookfield Thermosel, no. 27 Spindle, 20 rpm, 190 °C | D 4402 | 2.5–3.5 Pa·s |

Replace the paragraph in section 86-5.01A(3)(d) with:

Use epoxy sealant for repair work in and around sawcuts housing inductive loops.

Replace "all loop conductors" in the 3rd paragraph of section 86-5.01A(4) with:

the detector lead-in cable

Replace "Encase the loop wires" in the 1st sentence of the 3rd paragraph of section 86-5.01A(5) with:

The loop wires must be encased

Replace section 86-5.02 with:

**86-5.02 PUSH BUTTON ASSEMBLIES**

The housing for a push button assembly must be die-cast or permanent mold-cast aluminum. The assembly must be rainproof and shockproof in any weather condition.

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). The switch 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. 2-inch minimum diameter actuator

Where a push button is attached to a pole, the housing must be shaped to fit the pole's curvature. Use saddles if needed to make a neat and secure fit.

Where a push button is mounted on top of a 2-1/2-inch-diameter post, fit the housing with a slip fitter and use screws to rigidly secure it to the post.

Install the push button and the sign on the crosswalk side of the pole.

Attach the sign on a Type B push button assembly.

For a Type C push button assembly, mount the instruction sign on the same standard as the assembly using 2 straps and saddle brackets.

Add to section 86-5:

86-5.03 ACCESSIBLE PEDESTRIAN SIGNAL

Reserved

Replace "lthe amp" in item 2 in the list in the 1st paragraph of section 86-6.01A(2) with:

the lamp

DIVISION X MATERIALS
88 GEOSYNTHETICS

Add to section 88-1.01C:

Geosynthetics must be on the DataMine list for geotextiles and geosynthetics at the National Transportation Product Evaluation Program Web site. The product name, manufacturing source, and date of manufacture must be printed every 5 meters along the edge of the material.

Exceptions are:
1. Paving mat
2. Paving grid, Class 2 and 3
3. Biaxial geogrid

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

<table>
<thead>
<tr>
<th>Puncture strength, lb min</th>
<th>ASTM D 6241</th>
<th>310</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapezoid tearing strength, lb min</td>
<td>ASTM D 4533</td>
<td>56</td>
</tr>
</tbody>
</table>

Replace the 3rd paragraph in section 88-1.02C with:

Geocomposite wall drain must be from 0.25 to 2 inches thick.
Replace the value for permittivity of woven fabric in the table in the 1st paragraph of section 88-1.02E with:

0.05

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

0.012

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Test</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab breaking load, lb, 1-inch grip min, in each direction</td>
<td>ASTM D 4632</td>
<td>200 250</td>
</tr>
<tr>
<td>Apparent elongation, percent min, in each direction</td>
<td>ASTM D 4632</td>
<td>10 50</td>
</tr>
<tr>
<td>Water flow rate, gal per minute/sq ft min and max average roll value</td>
<td>ASTM D 4491</td>
<td>100-200 75-200</td>
</tr>
<tr>
<td>Permittivity, sec$^{-1}$ min</td>
<td>ASTM D 4491</td>
<td>1.0 1.0</td>
</tr>
<tr>
<td>Apparent opening size, inches max average roll value</td>
<td>ASTM D 4751</td>
<td>0.023 0.012</td>
</tr>
<tr>
<td>Ultraviolet resistance, % min retained grab breaking load, 500 hr.</td>
<td>ASTM D 4355</td>
<td>70 70</td>
</tr>
</tbody>
</table>

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

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

Replace section 88-1.02P with:

88-1.02P Biaxial Geogrid

Geosynthetics used for biaxial geogrid must be a punched and drawn polypropylene material formed into an integrally formed biaxial grid. When tested under the referenced test methods, properties of biaxial geogrid must have the values shown in the following table:
Biaxial Geogrid

<table>
<thead>
<tr>
<th>Property</th>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aperture size, inch² min and max</td>
<td>Calipered</td>
<td>0.8-1.3 x 1.0-1.6</td>
</tr>
<tr>
<td>Rib thickness, inch min</td>
<td>Calipered</td>
<td>0.04</td>
</tr>
<tr>
<td>Junction thickness, inch min</td>
<td>Calipered</td>
<td>0.150</td>
</tr>
<tr>
<td>Tensile strength, 2% strain, lb/ft³ min</td>
<td>ASTM D 6637</td>
<td>410 x 620</td>
</tr>
<tr>
<td>Tensile strength at ultimate, lb/ft³ min</td>
<td>ASTM D 6637</td>
<td>1,310 x 1,970</td>
</tr>
<tr>
<td>Ultraviolet resistance, percent min retained tensile strength, 500 hours</td>
<td>ASTM D 4355</td>
<td>100</td>
</tr>
<tr>
<td>Junction strength, lb/ft³ min</td>
<td>ASTM D 7737</td>
<td>1,220 x 1,830</td>
</tr>
<tr>
<td>Overall flexural rigidity, mg-cm min</td>
<td>ASTM D 7748</td>
<td>750,000</td>
</tr>
<tr>
<td>Torsional rigidity at 20 cm-kg, mm-kg/deg²</td>
<td>GRI:GG9</td>
<td>0.65</td>
</tr>
</tbody>
</table>

*A Machine direction x cross direction

** Geosynthetic Research Institute, Test Method GG9, Torsional Behavior of Bidirectional Geogrids When Subjected to In-Plane Rotation

Replace section 88-1.02Q with:

88-1.02Q Geosynthetic Bond Breaker

Geosynthetic bond breaker must be nonwoven; needle punched; not heat treated; polypropylene, polyethylene material.

When tested under the referenced test methods, properties of geosynthetic bond breaker material must have the values shown in the following table:

<table>
<thead>
<tr>
<th>Geosynthetic Bond Breaker</th>
<th>Property</th>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mass per unit area, oz/sq yd min</td>
<td>ASTM D 5261</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td>Thickness at 29 psi, mm min</td>
<td>ASTM D 5199</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Tensile strength at ultimate, lbs/ft² min</td>
<td>ASTM D 4595</td>
<td>685</td>
</tr>
<tr>
<td></td>
<td>Elongation, percent max</td>
<td>ASTM D 4595</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Permittivity at 2.9 psi, m/s min</td>
<td>ASTM D 5493</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Hydraulic transmissivity at 29 psi, m/s min</td>
<td>ASTM D 6574</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>Ultraviolet resistance, percent min retained grab breaking load, 500 hours</td>
<td>ASTM D 4355</td>
<td>60</td>
</tr>
</tbody>
</table>

90 CONCRETE

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

08-05-11
Submit weighmaster certificates in printed form or, if authorized, in electronic media. Present electronic media in a tab-delimited format on a CD or DVD. Captured data for the ingredients represented by each batch must be line feed carriage return and one line separate record with sufficient fields for the specified data.

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

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

Replace the 1st paragraph of section 90-4.01A with:

Section 90-4 includes specifications for fabricating PC concrete members.

Replace the paragraphs in section 90-4.01C with:

90-4.01C(1) General
For reports and logs, type or clearly print the name next to the signature of the person signing the report or log.

Submit expansion test data under section 90-4.02, if required.

90-4.01C(2) Certificates of Compliance
Submit a certificate of compliance for the cementitious material used in PC concrete members. The certificate must be signed by the PC concrete product manufacturer.

Submit a certificate of compliance for each PC concrete member. The certificate of compliance for tier 1 and tier 2 members must be signed by the QC manager. The certificate of compliance for tier 3 members must be signed by the QC Inspector.

90-4.01C(3) Precast Concrete Quality Control Plan
Before performing any precasting activities for tier 1 and tier 2 PC concrete members, submit 3 copies of the project-specific QC plan for the PC plant. The QC plan must supplement the information from the authorized facility audit. Submit a separate QC plan for each plant. Allow 25 days for review.

Each project-specific QC plan must include:

1. Name of the precasting plant, concrete plants, and any testing laboratory to be used.
2. Manual prepared by the precasting plant that includes:
   2.1. Equipment description
   2.2. Testing procedures
   2.3. Safety plan
   2.4. Personnel names, qualifications, and copies of certifications
3. QC manager and QC inspector names, qualifications, and copies of certifications.
4. Organizational chart showing QC personnel and their assigned QC responsibilities.
5. Methods and frequencies for performing QC procedures including inspections, material testing, and any survey performed for all components of PC concrete members. Components include prestressing, concrete, grout, reinforcement, steel, miscellaneous metal, and formwork.
6. System for reporting noncompliant PC concrete members to the Engineer.
7. System for identification and tracking repairs and repair methods.
8. Procedure for the reinspection of repaired PC concrete members.
9. Forms for certificates of compliance, daily production logs, and daily reports.

Submit a revised QC plan for any changes to:

1. Concrete plants
2. Material sources
3. Material testing procedures
4. Testing laboratory
5. Procedures and equipment
6. Updated systems for tracking and identifying PC concrete members
7. QC personnel

After authorization, submit 7 copies of each authorized QC plan and make 1 copy available at each location where work is performed.

Allow 7 days for review of a revised QC plan.

90-4.01C(4) Daily Production Log

The QC inspector must provide reports to the QC manager for each day that precasting activities are performed.

The QC manager must maintain a daily production log of PC activities for each day's precasting. PC activities include setting forms, placing reinforcement, setting prestressing steel, casting, curing, post tensioning, and form release. This daily log must be available at the precasting plant. The daily log must include:

1. Plant location
2. Specific description of casting or related activities
3. Any problems or deficiencies discovered
4. Any testing or repair work performed
5. Names of QC inspectors and the specific QC inspections they performed that day
6. Reports for that day's precasting activities from each QC inspector including before, during, and after precast inspections

Immediately notify the Engineer when any precasting problems or deficiencies are discovered, and submit the proposed repair or process changes necessary to correct them.

90-4.01C(5) Precast Concrete Report

Before shipping PC concrete members, submit a PC concrete report. The report must include:

1. Reports of all material tests and any survey checks
2. Documentation that:
   2.1. You have evaluated all tests
   2.2. You corrected all rejected deficiencies
   2.3. Repairs have been reexamined with the required tests and found acceptable
3. Daily production logs
4. Certificates of compliance
5. Documentation of inspections

Each person who performs a material test or survey check must sign the corresponding report and submit the report directly to the QC manager.

Replace the paragraphs in section 90-4.01D with:

90-4.01D(1) General

Quality control and assurance for PC concrete includes:

1. Your QC program
2. Department's acceptance of PC concrete members

PC concrete members are categorized into the following 4 tiers:

1. Tier 1 consists of:
   1.1. Components of bridge structures, including girders, deck panels, bent caps, abutments, slabs, closure wall panels, and piling
   1.2. Prestressed pavement
2. Tier 2 consists of:
   2.1. Components of earth retaining systems
   2.2. Wingwalls
   2.3. Types A, B, and C pipe culvert headwalls, endwalls, and wingwalls
   2.4. Pavement
   2.5. Box culverts
   2.6. Sound wall panels and supports
3. Tier 3 consists of:
   3.1. Pipes
   3.2. Pipe drainage facilities
   3.3. Straight and "L" pipe culvert headwalls except those listed under tier 2
   3.4. Drainage Inlets
   3.5. Flared end sections
4. Tier 4 consists of any member not described as tier 1, tier 2, or tier 3

90-4.01D(2) Quality Control

90-4.01D(2)(a) General

For tier 1 and tier 2 PC concrete members:

1. Fabricate PC concrete members at a plant on the Authorized Facility Audit List
2. Assign a PC concrete QC manager to the plant
3. Assign a QC inspector who is either registered as a civil engineer in the State or:
   3.1. For tier 1, has a Plant Quality Personnel Level II certification from the Precast/Prestressed Concrete Institute
   3.2. For tier 2, has a Plant Quality Personnel Level I certification from the Precast/Prestressed Concrete Institute
4. Prepare a PC concrete QC plan
5. Perform PC concrete materials testing
6. Maintain a daily production log
7. Prepare a PC concrete report
8. Prepare a certificate of compliance

For tier 3 PC concrete members:

1. Assign a QC inspector who has one of the following qualifications:
   1.1. Registration as a civil engineer in the State.
   1.2. Plant Quality Personnel, Level I certification from the Precast/Prestressed Concrete Institute.
   1.3. Competency to perform inspection of PC operations. An inspector is competent if the individual has completed training or has experience in PC operations and inspection.
2. Prepare a certificate of compliance

For tier 4 PC concrete members, prepare a certificate of compliance.

For each ASTM test method specified in this section, the material’s test result must comply with the requirement specified for the comparable test in section 90 unless otherwise specified.

If curing compound is used, provide certificate of compliance as specified in section 90-1.01C(5).

If PC concrete is manufactured at an established PC concrete plant, a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures under section 90-1.01D(5)(b) are not required.

90-4.01D(2)(b) Quality Control Meeting

After submitting the PC concrete QC plan, hold a meeting to discuss the requirements for PC concrete QC. The meeting attendees must include the Engineer, the PC concrete QC manager, and a representative from each plant performing PC concrete activities for the Contract.

90-4.01D(2)(c) Sampling, Testing, and Inspecting

The QC laboratory testing personnel or the QC inspector must witness sampling. The QC laboratory testing personnel must perform testing.

QC laboratory testing personnel must have the following certifications, as applicable:

1. ACI Strength Testing Technician
2. ACI Concrete Laboratory Testing Technician Level 1
3. ACI Aggregate Testing Technician Level 2

The QC Inspector must perform inspections before, during, and after casting is complete.
QC field testing and inspection personnel must have an ACI Concrete Field Testing Technician, Grade I certification.

For each mix design used for tier 1 and tier 2 PC concrete members, perform sampling and testing at the minimum frequencies shown in the following tables:

### Aggregate QC Tests

<table>
<thead>
<tr>
<th>Property</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate gradation</td>
<td>ASTM C136</td>
<td>Once per 400 cu yd of concrete cast or once a week, whichever is more frequent</td>
</tr>
<tr>
<td>Sand equivalent</td>
<td>ASTM D2419</td>
<td></td>
</tr>
<tr>
<td>Percent fines under 75 microns&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ASTM C117</td>
<td></td>
</tr>
<tr>
<td>Moisture content of fine aggregate</td>
<td>ASTM C566, or electronically actuated moisture meter&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1–2 times per each day of pour, depending on conditions</td>
</tr>
</tbody>
</table>

<sup>a</sup>Percent fines under 75 microns test replaces the cleanness test in section 90-1.02C with the requirements of 1.5 percent maximum for "Operating Range" and 2.0 percent maximum for "Contract Compliance." The 5th paragraph of section 90-1.02C(2) does not apply.

<sup>b</sup>Electronically actuated moisture meter must be calibrated once per week per ASTM C566.

### Concrete QC Tests

<table>
<thead>
<tr>
<th>Property</th>
<th>Test method</th>
<th>Minimum testing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength&lt;sup&gt;b&lt;/sup&gt;</td>
<td>ASTM C172/C172M, ASTM C31/C31M, and ASTM C39/C39M</td>
<td>Once per 100 cu yd of concrete cast, or every day of casting, whichever is more frequent</td>
</tr>
<tr>
<td>Slump</td>
<td>ASTM C143/C143M</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>ASTM C1064/C1064M</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>ASTM C138</td>
<td>Once per 600 cu yd of concrete cast or each week of batching, whichever is more frequent</td>
</tr>
<tr>
<td>Air content</td>
<td>ASTM C231/C231M or ASTM C173/C173M&lt;sup&gt;a&lt;/sup&gt;</td>
<td>If concrete is air entrained, once for each set of cylinders, and when conditions warrant</td>
</tr>
</tbody>
</table>

<sup>a</sup>ASTM C173/C173M must be used for lightweight concrete.

<sup>b</sup>Cylinders must be 6 by 12 inches.

If concrete is batched at more than 1 plant, perform the tests at each plant.

Cure test cylinders for determining time of prestressing loading in the same manner as the concrete in the member.
Cure test cylinders for determining compliance with 28-day strength requirements in the same manner as the member until completion of the steam curing process followed by a water bath or moist room at 60 to 80 degrees F until tested.

For PC concrete that is steam cured, concrete designated by compressive strength is acceptable if its compressive strength reaches the described 28-day compressive strength in no more than the maximum number of days specified or allowed after the concrete is cast.

**90-4.01D(3) Quality Assurance**
For PC concrete that is steam cured, the Engineer evaluates the compressive strength based on individual tests representing specific portions of production.

*Add between the 1st and 2nd paragraphs of section 90-4.02:*

PC portland cement based repair material must be on the Authorized Material List.

If municipally supplied potable water is used for PC concrete, the testing specified in section 90-1.02D is waived unless requested.

*Add to section 90-4.03:*

For dimensional tolerances of PC concrete members, comply with the Precast/Prestressed Concrete Institute Concrete Institute's *Tolerance Manual for Precast and Prestressed Concrete Construction, MNL 135-00.*

For tier 1 and tier 2 PC concrete members, apply curing compound using power-operated spraying equipment. You may request application by hand spraying for small quantities of PC concrete members. For tier 3 and tier 4 PC concrete members, the application of curing compound may be hand sprayed.

*Replace the item 2 in the list in the 2nd paragraph of section 90-4.03 with:*

2. To prevent moisture loss on the exposed surfaces during the presteaming period, cover the concrete as soon as possible after casting or keep the exposed surfaces wet by fog spray, curing compound, or wet blankets.

*91 PAINT*

*10-19-12*

*Add to section 91-2:*

**91-2.03 MOISTURE-CURED POLYURETHANE COATING**

Reserved

*Replace "saint" in the 1st paragraph of section 91-4.05 with:*

paint

*92 ASPHALTS*

*07-19-13*

*Replace "Reserved" in section 92-1.01B with:*

modified asphalt binder: Asphalt binder modified with polymers, crumb rubber, or both.

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

01-20-12
Replace 2nd paragraph of section 92-1.02B with:

PG modified asphalt binder must comply with the requirements shown in the following table:

**PG Modified Asphalt Binder**

<table>
<thead>
<tr>
<th>Property</th>
<th>AASHTO Test Method</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PG 58–34 M</td>
</tr>
<tr>
<td>Original Binder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash point, min °C</td>
<td>T 48</td>
<td>230</td>
</tr>
<tr>
<td>Solubility, min %</td>
<td>T 44a</td>
<td>97.5</td>
</tr>
<tr>
<td>Viscosity at 135 °C, max, Pa's</td>
<td>T 316</td>
<td>3.0</td>
</tr>
<tr>
<td>Dynamic shear, Test temperature at 10 rad/s, °C</td>
<td>T 315</td>
<td>58</td>
</tr>
<tr>
<td>min G*/sin(delta), kPa</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>RTFO test</td>
<td>T 240</td>
<td>1.00</td>
</tr>
<tr>
<td>RTFO Test Aged Binder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic shear, Test temperature at 10 rad/s, °C</td>
<td>T 315</td>
<td>58</td>
</tr>
<tr>
<td>min G*/sin(delta), kPa</td>
<td></td>
<td>2.20</td>
</tr>
<tr>
<td>Elastic recovery, Test temperature °C</td>
<td>T 301</td>
<td>25</td>
</tr>
<tr>
<td>min recovery, %</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>PAV, temperature, °C</td>
<td>R 28</td>
<td>100</td>
</tr>
<tr>
<td>RTFO Test and PAV Aged Binder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic shear, Test temperature at 10 rad/s, °C</td>
<td>T 315</td>
<td>16</td>
</tr>
<tr>
<td>max G*sin(delta), kPa</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>Creep stiffness, Test temperature, °C</td>
<td>T 313</td>
<td>-24</td>
</tr>
<tr>
<td>max S-value, MPa</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>min M-value</td>
<td></td>
<td>0.300</td>
</tr>
</tbody>
</table>
aThe Department allows ASTM D 5546 or ASTM D 7753 instead of AASHTO T 44. Particles recovered from ASTM D 5546 or ASTM D 7753 or AASHTO T 44 must be less than 250 μm.
bReport only for spray application.
cThe Engineer waives this specification if the supplier provides written certification the asphalt can be adequately pumped and mixed at temperatures meeting applicable safety standards.
d“RTFO Test” means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T 240 or ASTM D 2872. The residue from mass change determination may be used for other tests.
eTest 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. The graph must have at least two 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.
fTests without a force ductility clamp may be performed.
g“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 amount of crumb rubber by weight of asphalt binder
2. Certify a minimum of 10 percent of crumb rubber by weight of asphalt binder

93 LIQUID ASPHALTS
07-19-13
Replace "Celsius" the 1st row in the table in the 8th paragraph of section 93-1.04 with: Fahrenheit

94 ASPHALTIC EMULSIONS
03-21-14
Replace the 1st paragraph of section 94-1.04 with:
Asphaltic emulsion is measured by weight under the specifications requiring its use. If water is added to the asphaltic emulsion, the quantity of asphaltic emulsion is determined before the addition of water.
Replace section 39-1.23 with:

39-1.23 HOT MIX ASPHALT TYPE C
39-1.23A General
39-1.23A(1) Summary
Except if specified for Type C, the specifications for HMA Type A apply to HMA Type C.
Produce and place HMA Type C under the **Standard** construction process.

39-1.23A(2) Submittals
Submit with the JMF submittal:
1. California Test 204 plasticity index results
2. California Test 371 tensile strength ratio results for untreated HMA Type C
3. California Test 371 tensile strength ratio results for treated HMA Type C if untreated HMA Type C tensile strength ratio is below 70

At JMF submittal, production start-up, and every 5,000 tons, submit the California Test 371 test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

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

39-1.23A(3) Quality Control and Assurance
For the mix design, determine the plasticity index of the aggregate blend under California Test 204. Choose an antistrip treatment and use the corresponding laboratory procedure for the mix design as shown in the following table:

<table>
<thead>
<tr>
<th>Antistrip Treatment Laboratory Procedures for Mix Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antistrip treatment</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Plasticity index from 4 to 10 a</td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
</tr>
<tr>
<td>Plasticity index less than 4</td>
</tr>
<tr>
<td>Liquid</td>
</tr>
<tr>
<td>Dry hydrated lime without marination</td>
</tr>
<tr>
<td>Dry hydrated lime with marination</td>
</tr>
<tr>
<td>Lime slurry with marination</td>
</tr>
</tbody>
</table>

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

For the mix design, determine tensile strength ratio under California Test 371 on untreated HMA Type C. If the tensile strength ratio is less than 70:
1. Choose from the antistrip treatments specified based on plasticity index
2. Test treated HMA under California Test 371
3. Treat to a minimum tensile strength ratio of 70

On the 1st production day and every 5,000 tons, sample and test under California Test 371.

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

For the mix design, determine the OBC at 5% percent air void content.
Determine the proposed JMF for HMA Type C from a mix design that has the values for the quality characteristics shown in the following table:

### HMA Type C Mix Design Requirements

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air void content (%)a</td>
<td>California Test 367</td>
<td>4.0 5.0</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)b</td>
<td>LP-2</td>
<td>14.0 15.0</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>13.0 14.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 1&quot;</td>
<td></td>
<td>12 13</td>
</tr>
<tr>
<td>with NMAS = 3/4&quot;</td>
<td></td>
<td>13 14</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>65.0–75.0 60.0–70.0</td>
</tr>
<tr>
<td>1/2&quot; grading</td>
<td></td>
<td>65.0–75.0 60.0–70.0</td>
</tr>
<tr>
<td>3/4&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; grading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion c (P200/Pbe)</td>
<td>LP-4</td>
<td>0.6–1.3 0.6–1.3</td>
</tr>
<tr>
<td>Stabilometer value (min)d</td>
<td>California Test 366 (Modified)</td>
<td>37 (Modified) 35</td>
</tr>
</tbody>
</table>

a Calculate the air void content of each specimen using California Test 309 and Laboratory Procedure LP-1. Modify California Test 367, Paragraph C5, to use the exact air void content specified in the selection of OBC.  
b Minimum voids in the mineral aggregate (VMA) is dependent upon the nominal maximum aggregate size (NMAS) of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.  
c Asphalt content based on dry weight of aggregate  
d California Test 304, Part 2.13.  
e Comply with California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.  
f Modify California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.

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

With the minimum quality control testing for the specified construction process, perform sampling and testing at the specified minimum frequency for the quality characteristics shown in the following table:
## HMA Type C Minimum Quality Control

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Minimum sampling and testing frequency</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td>1 per 750 tons and any remaining part</td>
<td>JMF ± 0.40</td>
</tr>
<tr>
<td>Stabilometer Value (min)</td>
<td>California Test 366</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more</td>
<td>37 $^c$ (Modified) 35 $^d$</td>
</tr>
<tr>
<td>Air void content (%)</td>
<td>California Test 367</td>
<td></td>
<td>Design ± 2</td>
</tr>
<tr>
<td>Percent of crushed particles</td>
<td>California Test 205</td>
<td>1 per 5,000 tons or 1 per 5 business days, whichever is more</td>
<td>95</td>
</tr>
<tr>
<td>Fine aggregate angularity (%)</td>
<td>California Test 234</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Los Angeles Rattler</td>
<td>California Test 211</td>
<td>As necessary and designated in the QC plan. At least once per project</td>
<td>12</td>
</tr>
<tr>
<td>Flat and elongated particles (% max by weight @ 5:1)</td>
<td>California Test 235</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (%)</td>
<td>California Test 375</td>
<td>1 per 750 tons or any single location, whichever is less</td>
<td>92–97 91–96</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)</td>
<td>LP-2</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more</td>
<td>14 13 14</td>
</tr>
<tr>
<td>1/2&quot; gradation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; gradation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; gradation $^k$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 1&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with NMAS = 3/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td>65–75 60–70 65–75 60–70 65–75 60–70 65–75 60–70</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; gradation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot; gradation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; gradation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust proportion (% P200/Pbe)</td>
<td>LP-4</td>
<td>1 per 4,000 tons or 1 per 2 business days, whichever is more (Report Only)</td>
<td>0.6–1.3 0.6–1.3</td>
</tr>
</tbody>
</table>

---

$^a$ Report the average of 3 tests from a single split sample.

$^b$ If the stability range is more than 8 points, prepare and test new briquettes.

$^c$ Comply with California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.

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

$^e$ Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A. Determine theoretical maximum specific gravity under California Test 309. Calculate the air void content of each specimen using California Test 309 and Laboratory Procedure LP-1. Modify California Test 367, Paragraph C5, to use the design air void content specified.
Aggregate must comply with the quality specifications before it is treated with lime. During lime treatment except for dry lime on damp aggregate treatment at continuous mixing plants, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Prepare and test 3 samples from a single split sample for aggregate quality at the frequency specified during lime treatment and report test results as the average of the 3 tests.

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

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

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

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

Minimum VMA dependent upon NMAS of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.

Asphalt content based on dry weight of aggregate.

With the acceptance testing for the specified construction process, the Engineer samples and tests the quality characteristics for the values shown in the following table:
## HMA Type C Acceptance

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt binder content (%)</td>
<td>California Test 379 or 382</td>
<td>JMF ± 0.40</td>
</tr>
<tr>
<td>Stabilometer Value (min) (^a, d)</td>
<td>California Test 366</td>
<td>37 (^e) (Modified) 35 (^d)</td>
</tr>
<tr>
<td>Air void content (%) (^a, e)</td>
<td>California Test 367</td>
<td>Design ± 2</td>
</tr>
<tr>
<td>Percent of crushed particles (^f)</td>
<td>California Test 205</td>
<td>95</td>
</tr>
<tr>
<td>Coarse aggregate (% min) Two fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve) (% min) One fractured face</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>Fine aggregate angularity (% min) (^g)</td>
<td>California Test 234</td>
<td>45</td>
</tr>
<tr>
<td>Los Angeles Rattler (^f) Loss at 100 rev. (% max) Loss at 500 rev. (% max)</td>
<td>California Test 211</td>
<td>12 40</td>
</tr>
<tr>
<td>Flat and elongated particles (^f) (^g)</td>
<td>California Test 235</td>
<td>10</td>
</tr>
<tr>
<td>Percent of maximum theoretical density (%) (^h, i, j)</td>
<td>California Test 375</td>
<td>92–97 91–96</td>
</tr>
<tr>
<td>Voids in mineral aggregate (% min)</td>
<td>LP-2</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; gradation</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>3/4&quot; gradation</td>
<td></td>
<td>13 14</td>
</tr>
<tr>
<td>1&quot; gradation (^k) with NMAS = 1&quot;</td>
<td></td>
<td>12 13</td>
</tr>
<tr>
<td>with NMAS = 3/4&quot;</td>
<td></td>
<td>13 14</td>
</tr>
<tr>
<td>Voids filled with asphalt (%)</td>
<td>LP-3</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; gradation</td>
<td></td>
<td>65–75 60–70</td>
</tr>
<tr>
<td>3/4&quot; gradation</td>
<td></td>
<td>65–75 60–70</td>
</tr>
<tr>
<td>1&quot; gradation</td>
<td></td>
<td>65–75 60–70</td>
</tr>
<tr>
<td>Dust proportion (^l) (P200/Pbe)</td>
<td>LP-4</td>
<td>0.6–1.3 Report Only</td>
</tr>
</tbody>
</table>

\(^a\) The Engineer reports the average of 3 tests from a single split sample.
\(^b\) If the stability range is more than 8 points, the Engineer prepares and tests new briquettes.
\(^c\) The Engineer follows California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.
\(^d\) Modify California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi tamping pressure and 140 °F compaction temperature; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.
\(^e\) The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A. The Engineer determines theoretical maximum specific gravity under California Test 309. The Engineer calculates the air void content of each specimen using California Test 309 and Laboratory Procedure LP-1. The Engineer modifies California Test 367, Paragraph C5, to use the design air void content specified.
\(^f\) Aggregate must comply with the quality specifications before it is treated with lime. During lime treatment, except for dry lime on damp aggregate treatment at continuous mixing plants; the Engineer samples coarse and fine aggregate from individual stockpiles, combines aggregate in the JMF proportions, and prepares and tests 3 samples from a single split sample for aggregate quality at the frequency specified during lime treatment and report test results as the average of the 3 tests.
Void if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

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

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

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

Minimum VMA dependent upon NMAS of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.

Asphalt content based on dry weight of aggregate.

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

If the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot, the Engineer determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness.

For each 250 tons of HMA production, the Engineer determines a deduction for percent of maximum theoretical density using the factors for each average of 3 density cores as shown in the following table:

### Reduced Payment Factors for Percent of Maximum Theoretical Density

<table>
<thead>
<tr>
<th>HMA Type C percent of maximum theoretical density using the average of 3 cores</th>
<th>Reduced payment factor</th>
<th>HMA Type C percent of maximum theoretical density using the average of 3 cores</th>
<th>Reduced payment factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.0</td>
<td>0.0000</td>
<td>97.0</td>
<td>0.0000</td>
</tr>
<tr>
<td>91.9</td>
<td>0.0125</td>
<td>97.1</td>
<td>0.0125</td>
</tr>
<tr>
<td>91.8</td>
<td>0.0250</td>
<td>97.2</td>
<td>0.0250</td>
</tr>
<tr>
<td>91.7</td>
<td>0.0375</td>
<td>97.3</td>
<td>0.0375</td>
</tr>
<tr>
<td>91.6</td>
<td>0.0500</td>
<td>97.4</td>
<td>0.0500</td>
</tr>
<tr>
<td>91.5</td>
<td>0.0625</td>
<td>97.5</td>
<td>0.0625</td>
</tr>
<tr>
<td>91.4</td>
<td>0.0750</td>
<td>97.6</td>
<td>0.0750</td>
</tr>
<tr>
<td>91.3</td>
<td>0.0875</td>
<td>97.7</td>
<td>0.0875</td>
</tr>
<tr>
<td>91.2</td>
<td>0.1000</td>
<td>97.8</td>
<td>0.1000</td>
</tr>
<tr>
<td>91.1</td>
<td>0.1125</td>
<td>97.9</td>
<td>0.1125</td>
</tr>
<tr>
<td>91.0</td>
<td>0.1250</td>
<td>98.0</td>
<td>0.1250</td>
</tr>
<tr>
<td>90.9</td>
<td>0.1375</td>
<td>98.1</td>
<td>0.1375</td>
</tr>
<tr>
<td>90.8</td>
<td>0.1500</td>
<td>98.2</td>
<td>0.1500</td>
</tr>
<tr>
<td>90.7</td>
<td>0.1625</td>
<td>98.3</td>
<td>0.1625</td>
</tr>
<tr>
<td>90.6</td>
<td>0.1750</td>
<td>98.4</td>
<td>0.1750</td>
</tr>
<tr>
<td>90.5</td>
<td>0.1875</td>
<td>98.5</td>
<td>0.1875</td>
</tr>
<tr>
<td>90.4</td>
<td>0.2000</td>
<td>98.6</td>
<td>0.2000</td>
</tr>
<tr>
<td>90.3</td>
<td>0.2125</td>
<td>98.7</td>
<td>0.2125</td>
</tr>
<tr>
<td>90.2</td>
<td>0.2250</td>
<td>98.8</td>
<td>0.2250</td>
</tr>
<tr>
<td>90.1</td>
<td>0.2375</td>
<td>98.9</td>
<td>0.2375</td>
</tr>
<tr>
<td>90.0</td>
<td>0.2500</td>
<td>99.0</td>
<td>0.2500</td>
</tr>
<tr>
<td>&lt; 90.0</td>
<td>Remove and replace</td>
<td>&gt; 99.0</td>
<td>Remove and replace</td>
</tr>
</tbody>
</table>

For each 250 tons of HMA production, the Engineer determines a deduction for percent of maximum theoretical density using the factors for each average of 3 density cores shown in the following table:
### Reduced Payment Factors for Percent of Maximum Theoretical Density

<table>
<thead>
<tr>
<th>HMA Type C percent of maximum theoretical density using the average of 3 cores</th>
<th>Reduced payment factor</th>
<th>HMA Type C percent of maximum theoretical density using the average of 3 cores</th>
<th>Reduced payment factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.0</td>
<td>0.0000</td>
<td>96.0</td>
<td>0.0000</td>
</tr>
<tr>
<td>90.9</td>
<td>0.0125</td>
<td>96.1</td>
<td>0.0125</td>
</tr>
<tr>
<td>90.8</td>
<td>0.0250</td>
<td>96.2</td>
<td>0.0250</td>
</tr>
<tr>
<td>90.7</td>
<td>0.0375</td>
<td>96.3</td>
<td>0.0375</td>
</tr>
<tr>
<td>90.6</td>
<td>0.0500</td>
<td>96.4</td>
<td>0.0500</td>
</tr>
<tr>
<td>90.5</td>
<td>0.0625</td>
<td>96.5</td>
<td>0.0625</td>
</tr>
<tr>
<td>90.4</td>
<td>0.0750</td>
<td>96.6</td>
<td>0.0750</td>
</tr>
<tr>
<td>90.3</td>
<td>0.0875</td>
<td>96.7</td>
<td>0.0875</td>
</tr>
<tr>
<td>90.2</td>
<td>0.1000</td>
<td>96.8</td>
<td>0.1000</td>
</tr>
<tr>
<td>90.1</td>
<td>0.1125</td>
<td>96.9</td>
<td>0.1125</td>
</tr>
<tr>
<td>90.0</td>
<td>0.1250</td>
<td>97.0</td>
<td>0.1250</td>
</tr>
<tr>
<td>89.9</td>
<td>0.1375</td>
<td>97.1</td>
<td>0.1375</td>
</tr>
<tr>
<td>89.8</td>
<td>0.1500</td>
<td>97.2</td>
<td>0.1500</td>
</tr>
<tr>
<td>89.7</td>
<td>0.1625</td>
<td>97.3</td>
<td>0.1625</td>
</tr>
<tr>
<td>89.6</td>
<td>0.1750</td>
<td>97.4</td>
<td>0.1750</td>
</tr>
<tr>
<td>89.5</td>
<td>0.1875</td>
<td>97.5</td>
<td>0.1875</td>
</tr>
<tr>
<td>89.4</td>
<td>0.2000</td>
<td>97.6</td>
<td>0.2000</td>
</tr>
<tr>
<td>89.3</td>
<td>0.2125</td>
<td>97.7</td>
<td>0.2125</td>
</tr>
<tr>
<td>89.2</td>
<td>0.2250</td>
<td>97.8</td>
<td>0.2250</td>
</tr>
<tr>
<td>89.1</td>
<td>0.2375</td>
<td>97.9</td>
<td>0.2375</td>
</tr>
<tr>
<td>89.0</td>
<td>0.2500</td>
<td>98.0</td>
<td>0.2500</td>
</tr>
<tr>
<td>&lt; 89.0</td>
<td>Remove and replace</td>
<td>&gt; 98.0</td>
<td>Remove and replace</td>
</tr>
</tbody>
</table>

### 39-1.23B Materials

Asphalt binder used in HMA Type C must be PG 64-28PM.

Aggregate used in HMA Type C must comply with the 1/2-inch HMA Type C gradation.

Choose a sieve size target value (TV) within each target value limit shown in the following table:
### Aggregate Gradation
(Percenage Passing)

**HMA Type C**

<table>
<thead>
<tr>
<th>Sieve sizes</th>
<th>Target value limits</th>
<th>Allowable tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>90–98</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>64–84</td>
<td>TV ± 6</td>
</tr>
<tr>
<td>No. 4</td>
<td>42–57</td>
<td>TV ± 7</td>
</tr>
<tr>
<td>No. 8</td>
<td>29–39</td>
<td>TV ± 5</td>
</tr>
<tr>
<td>No. 30</td>
<td>13–19</td>
<td>TV ± 4</td>
</tr>
<tr>
<td>No. 200</td>
<td>3.0–7.0</td>
<td>TV ± 2</td>
</tr>
</tbody>
</table>

Before the addition of asphalt binder and lime treatment, aggregate for HMA Type C must have the values for the quality characteristics shown in the following table:

**HMA Type C Aggregate Quality**

<table>
<thead>
<tr>
<th>Quality characteristic</th>
<th>Test method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of crushed particles</td>
<td>California Test 205</td>
<td>95</td>
</tr>
<tr>
<td>Coarse aggregate (% min)</td>
<td>California Test 205</td>
<td>90</td>
</tr>
<tr>
<td>Two fractured faces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve.) (% min)</td>
<td>California Test 211</td>
<td>12</td>
</tr>
<tr>
<td>One fractured face</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Los Angeles Rattler (% max)</td>
<td>California Test 217</td>
<td>47</td>
</tr>
<tr>
<td>Loss at 100 rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss at 500 rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand equivalent &quot;a&quot; (min)</td>
<td>California Test 234</td>
<td>45</td>
</tr>
<tr>
<td>Fine aggregate angularity (% min)</td>
<td>California Test 235</td>
<td>10</td>
</tr>
<tr>
<td>Flat and elongated particles (% max by weight @ 5:1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"a Reported value must be the average of 3 tests from a single sample.

### 39-1.23C Construction

The 15th and 16th paragraphs of section 39-1.11 do not apply to HMA Type C.

Pave HMA Type C in maximum 0.20-foot-thick compacted layers.

Pave HMA Type C in maximum 0.35-foot-thick compacted layers.

Pave HMA Type C in maximum 0.45-foot-thick compacted layers.
THIS CONTRACT is made on the date set forth below, by and between the CITY OF GRASS VALLEY, a municipal corporation within the State of California (hereinafter "CITY"), and ______________________, a type in business form and state of license i.e. California Corporation, (hereinafter "CONTRACTOR"). The CITY and CONTRACTOR for the consideration hereinafter mentioned agree as follows:

ARTICLE 1: SCOPE OF WORK

1.1. CONTRACTOR agrees to furnish all work, labor, tools, materials, transportation, equipment, services, and other means of construction necessary to perform and complete in a good and workmanlike manner, those certain improvements as called for, and in the manner designated in, and in strict conformity with Contract No. _______ entitled: WEST MAIN STREET REHABILITATION PROJECT NO. 14-16, hereafter "PROJECT", in compliance with the Contract Documents as described in Article 3.

1.2. CONTRACTOR understands and agrees that the work, labor, tools, materials, transportation, equipment, incidentals, services and other means of construction for the Project shall be furnished and the work performed as required in the Contract Documents under the sole direction and control of CONTRACTOR, and subject to the inspection and approval of the CITY, or its representatives.

ARTICLE 2: CONTRACT PRICE

2.1. The CITY agrees to pay and the CONTRACTOR agrees to accept, in full payment for the work above agreed to be done, the sum of ($_______________) subject to additions and deductions as provided in the Contract Documents.

ARTICLE 3: CONTRACT DOCUMENTS

3.1. The complete Contract consists of the following documents, to wit:

- Notice to Contractors
- Executed Proposal, including the Bidder’s Bond
- Construction Contract
- Project Plans for this Project
- Special Provisions for this Project
- City of Grass Valley Improvement Standards
- Caltrans Standard Specifications, dated 2010
- Caltrans Standard Plans, dated 2010
- The latest version of Manual on Uniform Traffic Control Devices and California Supplement
- Equipment Rental Rates and General Prevailing Wage Rates of the State of California
- Department of Transportation, and where applicable, Federal wage rates and Section 14 Federal Fund S enclosures
- Executed Performance Bond
- Executed Labor and Materials Bond
- Certification Labor Code Section 1861
- List of Subcontractors
3.2. Any and all obligations of the CITY and the CONTRACTOR are fully set forth and described in the above documents. All of the above documents are intended to cooperate so that any work called for in one and not mentioned in the other or vice versa is to be executed the same as if mentioned in all said documents. The documents comprising the complete Contract are sometimes collectively referred to as the Contract Documents.

ARTICLE 4: TIME FOR PERFORMANCE - LIQUIDATED DAMAGES

4.1. The Commencement date of the Contract for determination of the time for completion shall be the date CONTRACTOR is directed to proceed by the City Engineer, as stated in the Notice to Proceed. The CONTRACTOR shall complete all work required by the Contract within twenty (20) working days after said commencement date, as adjusted and provided for in the Contract Documents.

4.2. In the event CONTRACTOR does not complete all work required by the Contract within the time specified above, liquidated damages shall be imposed upon the CONTRACTOR. CONTRACTOR agrees that if all the work called for under this Contract in all parts and requirements is not completed within the performance time period set forth above, damage will be sustained by CITY. As it is and will be impracticable to ascertain and determine the actual damage the CITY will sustain, CONTRACTOR agrees to pay to CITY five hundred dollars ($500.00) per calendar day for each and every day(s) delay in finishing the work in excess of the working days described. Time is of the essence in this contract. CONTRACTOR further agrees that CITY may deduct the amount of these damages from any moneys due or that may become due the CONTRACTOR under this Contract. To the extent appropriate, as determined by CITY in its sole discretion, CITY shall administer this Article in accordance with the California Department of Transportation Standard Specifications Section 8-1.10 Liquidated Damages, dated 2010.

ARTICLE 5: INDEMNITY & HOLD HARMLESS

5.1. The CITY, and all officers, agents, employees, outside parties hired to inspect and/or design the work, and volunteers thereof connected with the work, including but not limited to, the City Engineer and the Engineer, shall not be answerable or accountable in any manner for the loss or damage to any of the materials or other things used or employed in performing the work; for injury to or death of any person, either worker or the public; or damage to property from any cause which may have been prevented by CONTRACTOR or his or her workers or anyone employed by him/her.

5.2. CONTRACTOR shall be responsible for any liability imposed by law and for injuries to or death of any person including, but not limited to, workers and the public, or damage to property resulting from defects or obstructions or from any cause whatsoever during the progress of the work or at any time prior to its acceptance.

5.3. The CONTRACTOR shall indemnify and save harmless the CITY, and its officials, officers, agents, employees, or consultants and volunteers thereof connected with the work, including but not limited to, the City Engineer and the Engineer, from all claims, suits, or actions of every name, kind, and description brought forth on or on account of injuries to or death of any person, including but not limited to, workers or the public or damage to property resulting from the performance of the contract except as otherwise provided by statute 5.6. The duty of CONTRACTOR to indemnify and save harmless include the duties to defend as set forth in Civil Code Section 2778.

5.4. With respect to third party claims against the CONTRACTOR, the CONTRACTOR waives any and all rights to any type of express or implied indemnity against the CITY, its officials, officers, employees, agents, consultants, or volunteers.

5.5. It is the intent of the parties that the CONTRACTOR will indemnify and hold harmless the CITY, its officers, employees, agents and volunteers, from any and all claims, suits, or actions as set forth above, regardless of the existence or degree of fault or negligence on the part of the CITY, the CONTRACTOR, the subcontractors or employees of any of these, other than the sole or
ARTICLE 6: INSURANCE

6.1. Throughout the period of this agreement, the CONTRACTOR shall provide the following minimum insurance coverage as listed below. CONTRACTOR shall file with CITY certificate(s) of Insurance and endorsements, in a form acceptable to CITY, and consistent with this agreement at the time of execution of this agreement. The insurance company must be acceptable to CITY, with a Best's Rating of no less than A:VII. Documentation of such rating acceptable to the CITY shall be provided at the same time Insurance Certificates are submitted. The Current evidence of coverage provided to the City shall be for the entire required period of insurance, including the one (1) year warranty period.

6.1.1 Any deductibles must be declared to, and approved by, the City.

6.2. In the event any of the required policies are canceled prior to the completion of the project and the CONTRACTOR does not furnish a new certificate(s) of insurance prior to cancellation, the CITY may obtain the required insurance and deduct the premium(s) from Contract monies due the CONTRACTOR.

6.3. WORKER’S COMPENSATION AND EMPLOYERS LIABILITY INSURANCE:

6.3.a. The CONTRACTOR shall maintain adequate Workers’ Compensation Insurance under the Laws of the State of California. CONTRACTOR shall fully comply with the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for Workers’ Compensation or to undertake self insurance in accordance with the provisions of that Code, before commencing the performance of the work.

6.3.b. By CONTRACTOR’S signature hereunder, CONTRACTOR certifies that he/she is aware of the provisions of Section 3700 of the California 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 he/she will comply with such provisions before commencing the performance of this Contract.

6.3.c. If such insurance is underwritten by any agency other than State Compensation Fund, such agency shall be a company authorized to do business in the State of California.

6.3.d. CONTRACTOR shall require all subcontractors to maintain adequate Workers’ Compensation Insurance. Certificates of such Workers’ Compensation shall be filed forthwith with the CITY upon demand.

6.3.e. Worker's Compensation Insurance shall be provided as required by any applicable law or regulation. Employer's liability insurance shall be provided in amounts not less than the following:

- One Million dollars ($1,000,000) each accident for bodily injury by accident
- One Million dollars ($1,000,000) policy limit for bodily injury by disease
- One Million dollars ($1,000,000) each employee for bodily injury by disease

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

6.3.g. Each Worker's Compensation policy shall be endorsed with the following specific language:

Cancellation Notice:  "This policy shall not be canceled or materially changed without first giving thirty (30) days prior written notice to the City of Grass Valley."
**Waiver of Subrogation:** “The Insurance Company agrees to waive all rights of subrogation against the Entity, its elected or appointed officials, agents, employees and volunteers for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the Entity.

6.3 h. Contractor shall require all Subcontractors to maintain adequate Worker’s Compensation insurance. Certificates of Worker’s Compensation shall be filed forthwith with the CITY upon demand.

6.4. **GENERAL LIABILITY INSURANCE:**

6.4.a. Comprehensive General Liability or Commercial General Liability insurance no less broad than ISO form CG 00 01, covering all operations by or on behalf of CONTRACTOR, providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for: premises, operations; products and completed operations; contractual liability insuring the obligations assumed by CONTRACTOR in this Agreement; broad form property damage (including completed operations); explosion, collapse, and underground hazards; personal injury liability.

6.4.b. Except with respect to bodily injury and property damage included within the products and completed operations hazards, the aggregate limits, where applicable, shall apply separately to CONTRACTOR’S work under the Contract. One of the following forms is required: Commercial General Liability (Occurrence); or Commercial General Liability (Claims Made).

6.4.d. If CONTRACTOR carries a Commercial General Liability (Occurrence) policy:

1. The limits of liability shall not be less than:
   - One Million dollars ($1,000,000) each occurrence (combined single limit for bodily injury and property damage)
   - One Million dollars ($1,000,000) for Personal Injury Liability
   - Two Million dollars ($2,000,000) for Products-Completed Operations
   - Two Million dollars ($2,000,000) General Aggregate

2. If the policy does not have an endorsement providing that the General Aggregate Limit applies separately, or if defense costs are included in the aggregate limits, then the required aggregate limits shall be Two Million dollars ($2,000,000).

6.4.e. Special Claims Made Policy Form Provisions:

CONTRACTOR shall not provide a Commercial General Liability (Claims Made) policy without the express prior written consent of CITY, which consent, if given, shall be subject to the following conditions:

1. The limits of liability shall not be less than:
   - One Million dollars ($1,000,000) each Occurrence (combined single limit for bodily injury and property damage)
   - One Million dollars ($1,000,000) for Personal Injury Liability
   - Two Million dollars ($2,000,000) Aggregate for Products Completed Operations
   - Two Million dollars ($2,000,000) General Aggregate

2. The insurance coverage provided by CONTRACTOR shall contain language providing coverage up to one (1) year following the completion of the Contract in order to provide insurance coverage for the hold harmless provisions herein if the policy is a Claims Made Policy.
6.5. **Conformity of Coverages:**

6.5.a. If more than one policy is used to meet the required coverages, such as a separate umbrella policy, such policies shall be consistent with all other applicable policies used to meet these minimum requirements. For example, all policies shall be Occurrence Liability policies, or all shall be Claims Made Liability policies if approved by the CITY as noted above. In no case shall the types of coverages be different.

6.6. **Additional Requirements:**

6.6.a. Premium Payments: The insurance companies shall have no recourse against the CITY and funding agencies, its officers and employees or any of them for payment of any premiums or assessments under any policy issued by a mutual insurance company.

6.6.b. Policy Deductibles: The CONTRACTOR shall be responsible for all deductibles in all of CONTRACTOR'S insurance policies. The amount of deductibles for insurance coverage required herein should be reasonable and subject to CITY’S approval.

6.6.c. CONTRACTOR’S Obligations: CONTRACTOR’S indemnity and other obligations shall not be limited by the foregoing insurance requirements and shall survive the expiration of this agreement.

6.6.d. Material Breach: Failure of the CONTRACTOR to maintain the insurance required by this agreement, or to comply with any of the requirements of this section, shall constitute a material breach of the entire agreement.

6.6.e. Duration of Coverage: City must be an additional insured for completed operations for a period of one (1) year after completion of the work.

6.6.f. Project Reference: The Comprehensive or Commercial General Certificate of Insurance must reference the project specifically by project title.

6.7. **Endorsements:**

6.7.a. Each Comprehensive or Commercial General Liability policy shall be endorsed with the following specific language:

**Cancellation Notice:** "This policy shall not be canceled, material reduced, or materially changed without first giving thirty (30) days prior written notice to the City of Grass Valley."

**Waiver of Subrogation:** "The Insurance Company agrees to waive all rights of subrogation against the City of Grass Valley, its elected or appointed officials, agents, employees and volunteers for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the City of Grass Valley."

"Provisions Regarding the Insured's Duties: Any failure to comply with reporting provisions of the policy or breaches or violations of warranties shall not affect coverage provided to the Entity, its elected or appointed officers, officials, employees or volunteers."

"Except as stated above, nothing herein shall be held to waive, alter or extend any of the limits, conditions, agreements or exclusions of the policy to which this endorsement is attached."

"The City of Grass Valley, and additional insureds, and all insureds officers, agents, outside parties hired to inspect and/or design the work, employees, and volunteers are to be covered as insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement."

The City of Grass Valley's policy of insurance shall be excess and noncontributing. "The insurance provided by the Contractor, including any excess liability or umbrella form coverage, is
primary coverage to the City of Grass Valley and additional insureds, with respect to any insurance or self-insurance programs maintained by the City of Grass Valley and additional insureds, and no insurance held or owned by the City of Grass Valley and additional insureds shall be called upon to contribute to a loss.

6.8. AUTOMOBILE LIABILITY INSURANCE:

6.8.a. CONTRACTOR shall provide Automobile Liability insurance covering bodily injury and property damage in an amount no less than One Million dollars ($1,000,000) combined single limit for each occurrence.

6.8.b. Covered vehicles shall include owned, non-owned, and hired automobiles/trucks.

6.8 c. Endorsements: The endorsements listed above for each Comprehensive or General Liability Policy shall also apply to the Automobile Liability Policy.


ARTICLE 7: PRECEDENCE IN CONFLICTING DOCUMENTS

7.1. It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the bid or proposal of said CONTRACTOR, then this instrument shall control and nothing herein shall be considered as acceptance of the said terms of said proposal conflicting herewith.

ARTICLE 8: BOND REQUIREMENTS

8.1. CONTRACTOR shall furnish both a Faithful Performance Bond and a Payment Bond (hereinafter collectively "Bonds") in the full amount of the Contract on the forms provided by the CITY. CITY shall retain the Performance Bond for a one-year guarantee period from the date of the CITY’S acceptance of the work.

8.2. The bonds shall be obtained from a California admitted surety that is licensed by the State of California to act as surety upon bonds and undertakings and which maintains in this State at least one office for the conduct of its business. The surety shall furnish reports as to its financial condition from time to time upon request by CITY.

8.3. In case of any conflict between the terms of the Contract and the terms of the Bonds, the terms of the Contract shall control and the Bonds shall be deemed to be amended thereby.

8.4. CONTRACTOR agrees to obtain the consent of the surety, if required, to any change, extension of time, alteration, or addition to any of the terms of the Contract Documents.

ARTICLE 9: COMPLIANCE WITH LAWS

9.1. CONTRACTOR is an independent contractor and shall, at its sole cost and expense comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits (unless specifically stated elsewhere in the Contract Documents to be obtained by CITY) and licenses therefore, pay all manufacturers' taxes, sales taxes, use taxes, processing taxes, and all Federal and State taxes, insurance and contributions for social security and unemployment which are measured by wages, salaries or any remuneration paid to CONTRACTOR’S employees, whether levied under existing or subsequently enacted laws, rules or regulations. CONTRACTOR shall also pay all property tax assessments on materials or equipment used until acceptance by CITY. If any discrepancy or inconsistency is discovered in any of the Contract Documents in relation to any such law, rule, ordinance, regulation, order, or decree, the CONTRACTOR shall forthwith report the same to the CITY in writing.

9.2. Without limitation, materials furnished and performance by CONTRACTOR hereunder shall
comply with Safety Orders of the Division of Industrial Safety, State of California, Federal Safety regulations of the Bureau of Labor, Department of Labor; and any other applicable state or federal regulations.

9.3. CONTRACTOR, upon request, shall furnish evidence satisfactory to CITY that any or all of the foregoing obligations have been or are being fulfilled. CONTRACTOR warrants to CITY that it is licensed by all applicable governmental bodies to perform this Contract and will remain so licensed throughout the progress of the work, and that it has, or will have, throughout the progress of the work, the necessary experience, skill, and financial resources to enable it to perform this Contract.

9.4. CONTRACTOR is required to ensure that material safety data sheets (MSDS's) for any material requiring a MSDS pursuant to any federal or state law are available in a readily accessible place on the Project premises. CONTRACTOR is also required to ensure (a) the proper labeling of any substance brought onto the Project premises by CONTRACTOR or any subcontractors or material suppliers, and (b) that the person(s) working with the material, or within the general area of the material, are appropriately informed about the hazards of the substance and follow proper handling and protection procedures.

9.5. CONTRACTOR is required to comply with Health & Safety Sections 25249 et seq. (Prop. 65), which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer.

9.6. CONTRACTOR shall comply with Title VI of the Civil Rights Act of 1964 (PL 88-352) and all regulations or other requirements issued pursuant to that Act, including, without limitation, United States Department of Agriculture nondiscrimination regulations found at 7 CFR Part 15.

ARTICLE 10: PROGRESS SCHEDULE

10.1. The CONTRACTOR shall submit within ten (10) days (or as specified in the Special Provisions for this Project) after execution of the Contract a detailed work schedule or schedules that details the actions of the CONTRACTOR and Subcontractors working at the Site in accordance with the requirements specified in Special Provisions. This schedule(s) shall show the dates at which the CONTRACTOR will start and complete the several parts of the work and shall conform to the completion time specified in the Contract. The CITY may submit comments on the work schedule. Acceptance of the schedule by CITY shall not constitute approval of the Plan by CONTRACTOR for completion of the work.

10.2. The CONTRACTOR shall review and, if necessary, revise the progress schedule at least once a month or as specified in the Special Provisions for this Project. In any event, the CONTRACTOR shall submit a current schedule to the Engineer at the Engineer's request at any time during the Contract period.

10.3. No progress payments will be made for any work performed until a satisfactory schedule has been submitted and approved by the Engineer. An updated schedule shall be required from the CONTRACTOR if the project falls ten (10) working days behind schedule. For delays or portions of delays for which the CONTRACTOR is responsible, no payment will be made or time extension allowed for increase in work force, equipment, and working hours needed to put the Project on schedule.

ARTICLE 11: PROMPT PAYMENT PROVISIONS

11.1. Prompt payment provisions in accordance with Section 20104.50 of the Public Contract Code shall apply to this contract.

11.2. If CITY fails to make a progress payment within thirty (30) days after receipt of an undisputed and properly submitted payment request from CONTRACTOR, CITY shall pay interest to CONTRACTOR equivalent to 0.833% per month (10% per annum).
11.3. CITY shall review each payment request as soon as practicable after receipt to determine whether the payment request is proper. Any payment request determined to be an improper payment request shall be returned to CONTRACTOR as soon as practicable, but not later than seven (7) days, after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

ARTICLE 12: ANTITRUST CLAIM ASSIGNMENT

12.1. In entering into a Public Works contract or a subcontract to supply goods, services, or materials pursuant to this Contract, the CONTRACTOR and all subcontractors shall offer and agree to assign to CITY all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment shall be made and become effective at the time the CITY tenders final payment to CONTRACTOR, without further acknowledgment by the parties.

ARTICLE 13: PREVAILING WAGES

13.1. CONTRACTOR acknowledges that it has examined the prevailing rate of per diem wages as established by the California Director of Industrial Relations. The CONTRACTOR agrees to pay workers not less than the applicable prevailing rate of per diem wages, as set forth in these requirements and Labor Code section 1770 et seq. CONTRACTOR agrees specifically to comply with the provisions of Labor Code sections 1720, 1773.3, 1776, and 1777.5, as well as Section 7 of the Department of Transportation Standard Specifications and these Contract Documents.

ARTICLE 14: SEVERABILITY.

14.1. Nothing contained in the Contract Documents shall be construed to require the commission of any act contrary to law. Should a conflict arise between any provisions contained herein and any present or future statute, law, ordinance, or regulation contrary to which the parties have no legal right to contract or act, the latter shall be curtailed and limited but only to the extent necessary to bring it within the requirements of the law. If such curtailment or limitation is not possible, the affected provision shall be of no force and effect. Except as previously mentioned, such illegality shall not affect the validity of this Contract.

ARTICLE 15: COMPLETE AGREEMENT

15.1. These Contract Documents supersede any and all agreements, either oral or in writing, between the parties with respect to the subject matter herein. Each party to this Contract acknowledges that no representation by any party, which is not embodied herein, or any other agreement, statement, or promise not contained in these Contract Documents shall be valid and binding.

ARTICLE 16: INTERPRETATION

16.1. The parties hereto acknowledge and agree that each has been given the opportunity to independently review this Contract with legal counsel, and/or has the requisite experience and sophistication to understand, interpret and agree to the particular language of the provisions of the Contract.

16.2. In case of a controversy or dispute between the parties concerning the provisions herein, this document shall be interpreted according to the provisions herein and no presumption shall arise concerning the draftsmanship of such provision.

ARTICLE 17: GOVERNING LAW

17.1. This Contract is subject to the laws and jurisdiction of the State of California. Venue for any legal proceeding brought in conjunction with this Contract shall be the Superior Court of the County of Nevada, State of California. Contractor waives any federal court removal rights it may have pursuant to any applicable law.
### ARTICLE 18: BID ITEMS

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>UNIT OF MEAS.</th>
<th>EST. QTY.</th>
<th>UNIT PRICE</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Traffic Control System</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Demolition and Removal</td>
<td>LS</td>
<td>1</td>
<td></td>
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<tr>
<td>4</td>
<td>Asphalt Concrete Structural Section Replacement (Type C HMA, 4&quot; Depth)</td>
<td>SY</td>
<td>3520</td>
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<tr>
<td>5</td>
<td>Minor Concrete (Sidewalk/Curb Ramp)</td>
<td>SF</td>
<td>2245</td>
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<td>6</td>
<td>Minor Concrete (Curb)</td>
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<td>277</td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>Minor Concrete (Curb and Gutter)</td>
<td>LF</td>
<td>268</td>
<td></td>
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<tr>
<td>8</td>
<td>Minor Concrete (Valley Gutter)</td>
<td>SF</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Minor Concrete (Stamped Median)</td>
<td>SF</td>
<td>153</td>
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</tr>
<tr>
<td>10</td>
<td>Minor Concrete (Stamped Crosswalk)</td>
<td>SF</td>
<td>1728</td>
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</tr>
<tr>
<td>11</td>
<td>Detectable Warning Surface</td>
<td>EA</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Adjust Manhole to Grade</td>
<td>EA</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Adjust Utility Cover to Grade</td>
<td>EA</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Relocate Street Light</td>
<td>EA</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Object Marker</td>
<td>EA</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Roadside Sign</td>
<td>EA</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Thermoplastic Traffic Striping</td>
<td>LF</td>
<td>740</td>
<td></td>
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</tr>
<tr>
<td>19</td>
<td>Thermoplastic Traffic Marking</td>
<td>SF</td>
<td>1020</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL COST: $______________**

Name of Contractor/Company
WITNESS WHEREOF, the parties have hereunto set their hands the year and date first above written.

“CITY”  
CITY OF GRASS VALLEY  
By: ___________________________  
   Jason Fouyer, Mayor  
Date: _______________  

Award of Contract No. _____  
By the City Council On:  
Date: _______________  

APPROVED AS TO PROCEDURE  
By: ___________________________  
   Timothy M. Kiser, PE  
   Public Works Director/City Engineer  
Date: _______________  

APPROVED AS TO FORM  
By: ___________________________  
   Michael G. Colantuono  
   City Attorney  
Date: _______________  

ATTEST:  
By: ___________________________  
   Kristi K. Bashor  
   City Clerk  
Date: _______________  

“CONTRACTOR”  
(Type full legal name of contractor, entity type, state of organization here)  
By: ___________________________  
   Officer Signature # 1  
   (Signature Notarized)  
Date: _______________  

By: ___________________________  
   Print Name and Title  
Date: _______________  

By: ___________________________  
   Officer Signature # 2  
   (Signature Notarized)  
Date: _______________  

By: ___________________________  
   Print Name and Title  
Date: _______________  

Licensed in accordance with an act providing for the registration of Contractors,  
Contractor’s License Number: _____  

“If Contractor is a corporation, contract must be signed by the following two corporate officers, one from each category: (1) Chairman of the Board, President or any Vice President, and (2), Corporate Secretary, any Assistant Corporate Secretary, Chief Financial Officer or any Treasurer or Assistant Treasurer, unless an authenticated copy of a resolution of the corporation which delegates to a single officer the authority to bind the corporation is attached to this contract.

If Contractor is another type of business entity, such as a partnership or limited liability company, contract must be signed by officer(s) possessing legal authority to bind the entity. An authenticated copy of a resolution, partnership agreement, operating agreement or other legal evidence of signature authority must be attached to this contract.”
ATTACHMENTS

1. Certification Labor Code Section 1861
2. Bond for Labor & Materials
3. Bond for Faithful Performance
4. List of Subcontractors
CERTIFICATION

LABOR CODE SECTION 1861

STATE OF CALIFORNIA
CITY OF GRASS VALLEY

I, the undersigned, do hereby certify:

That I am aware of the provisions of Section 3700 of the Labor Code of the State of California, which requires 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.

Executed at: ________________________________
On: ________________________________

I certify under the penalty of perjury that the foregoing is true and correct.

CONTRACTOR - EMPLOYER

BY: ________________________________
PRINT NAME: ________________________________
TITLE: ________________________________
BOND FOR LABOR AND MATERIALS

KNOW ALL MEN BY THESE PRESENTS THAT WHEREAS, CITY OF GRASS VALLEY, STATE OF CALIFORNIA, hereinafter called the “Owner” has awarded to _________________, as Principal, hereinafter designated as the “Contractor,” a contract for the work described as follows:

WEST MAIN STREET REHABILITATION, PROJECT NO. 14-16

AND, WHEREAS, the 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 Owner in the amount required by law, in the sum of ______________________________ Dollars ($__________________________) 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 the Contractor, his or its heirs, executors, administrators, successors or assigns, or subcontractors shall fail to pay any of the persons referred to in Civil Code 3181, amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, or amount due the Franchise Tax Board as provided in Civil Code 3248, that the surety or sureties herein will pay for the same, in amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought in this bond, the said surety will pay reasonable attorneys’ fee to be fixed by the court.

This bond shall insure to the benefit of any of the persons referred to in Civil Code 3181 so as to give a right of action to such persons or their assigns in any suit brought upon this bond. Any such right of action shall be subject to the provisions of Civil Code 3267.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

PROVIDED, FURTHER, that surety covenants that it is an Admitted Surety Insurer in the State of California as defined by California Code of Civil Procedures, Section 995.120.

____________________________________  ______________________________________
*SURETY Attorney-In-Fact                 CONTRACTOR
(Signature must be notarized)            (Signature must be notarized)
Date: ____________________               Date: ____________________

Address of Surety: ______________________________________________________

* ATTORNEY-IN-FACT MUST HAVE POWER OF ATTORNEY ON FILE WITH CITY CLERK OF CITY OF GRASS VALLEY OR INCLUDE A COPY OF POWER OF ATTORNEY WITH THIS BOND.
BOND OF FAITHFUL PERFORMANCE

KNOW ALL MEN BY THESE PRESENTS THAT WE ____________________________,
the Contractor in the Contract hereto annexed, as principal, and ____________________________
as Surety are held and firmly bound unto the City of Grass Valley in the sum of
________________________________________ Dollars ($____________) lawful money of the
United States, for which payment, well and truly to be made, we bind ourselves, jointly and severally,
firmly by these presents

The condition of the above obligation is that if said principal as Contractor in the contract hereto
annexed shall faithfully perform each and all of the conditions of said contract to be performed by him,
and shall furnish all tools, equipment, apparatus, facilities, transportation, labor, and material, other
than material, if any, agreed to be furnished by the CITY, necessary to perform and complete, and to
perform and complete in a good workmanlike manner, and to guarantee acceptable performance of the
work for a period of one year following the acceptance of the project, the work of WEST MAIN STREET
REHABILITATION PROJECT NO. 14-16 in strict conformity with the terms and conditions set forth in
the contract hereto annexed, and after a period of one year following the acceptance of the project,
then this obligation shall be null and void, otherwise to remain in full force and effect; and the said
surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or
addition to the terms of the contract or to the work to be performed thereunder or the specifications
accompanying the same shall, in any wise, affect its obligation on this bond, and it does hereby waive
notice of any such change, extension of time, alteration or addition to the terms of the contract or to the
work or to the specifications.

Surety further agrees in case suit is brought upon this bond that it will pay, in addition to the basic
obligation herein, all court costs, expenses, and all reasonable attorney's fees to be awarded and fixed
by the Court, and to be taxed as costs, and to be included in the judgment therein rendered.

*SURETY Attorney-In-Fact
(Signature must be notarized)        CONTRACTOR
(Signature must be notarized)
Date: ____________________        Date: ____________________

Address of Surety: __________________________

*ATTORNEY-IN-FACT MUST HAVE POWER OF ATTORNEY ON FILE WITH CITY CLERK OF CITY
OF GRASS VALLEY OR INCLUDE A COPY OF POWER OF ATTORNEY WITH THIS BOND.
LIST OF SUBCONTRACTORS

The Contractor shall list the name, address, and contractor’s license classification and number of each Subcontractor required to be listed by Section 2-1.054, “Required Listing of Proposed Subcontractors,” of the Standard Specifications, and the Special Provisions, and designate the portion and percentage of the work to be performed by the Subcontractor, to whom the bidder proposes to subcontract portions of the work. The California contractor license designation and number shall be included for all subcontractors doing work in excess of one half of one percent of the total Project bid price, or one thousand dollars ($1,000.00), whichever is greater.

<table>
<thead>
<tr>
<th>Subcontractor Name &amp; Business Address</th>
<th>License Designation Number</th>
<th>Description of Portion of Work Contracted With Applicable Bid Item(s)</th>
<th>% of Work per Bid Item</th>
<th>Dollar Amount of Work</th>
</tr>
</thead>
</table>

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