

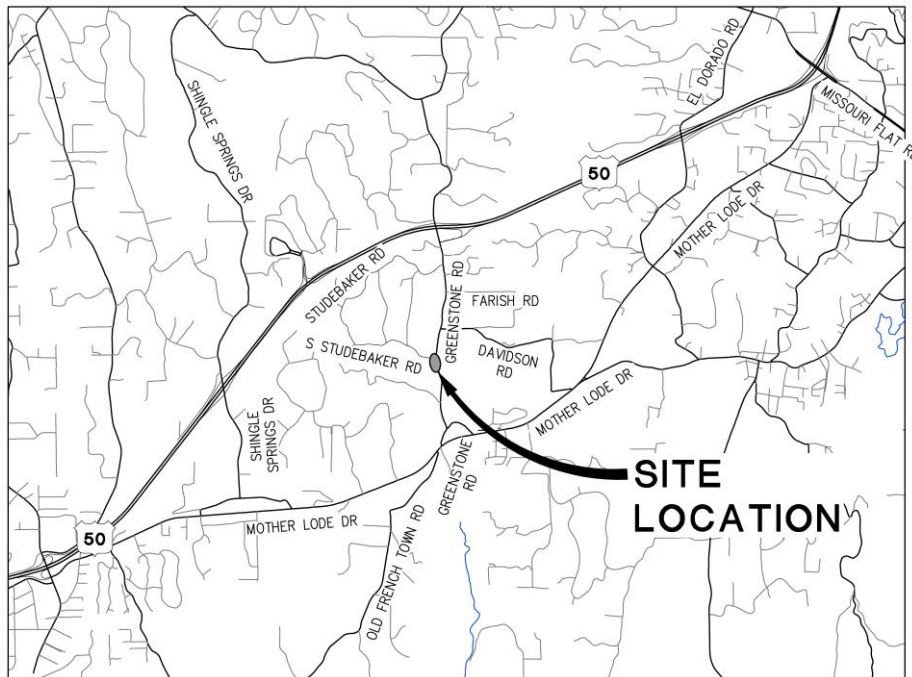
**COUNTY OF EL DORADO, CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

CONTRACT DOCUMENTS

INCLUDING
NOTICE TO BIDDERS, SPECIAL PROVISIONS,
PROPOSAL, AND AGREEMENT
FOR

**GREENSTONE ROAD AT SLATE CREEK
BRIDGE REPLACEMENT PROJECT**

CIP No. 77137, CONTRACT No. 3605
FEDERAL AID No. BRLO 5925(103)



FOR USE WITH
STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION,
2015 STANDARD SPECIFICATIONS AND STANDARD PLANS

BID OPENING DATE: MARCH 28, 2019

**COUNTY OF EL DORADO, CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

CONTRACT DOCUMENTS

INCLUDING
NOTICE TO BIDDERS, SPECIAL PROVISIONS,
PROPOSAL, AND CONTRACT
FOR

**Greenstone Road at Slate Creek
Bridge Replacement Project**

March 5, 2019

CIP No. 77137; Contract No. 3605

The various portions of the Contract Documents have been prepared under the direction of the following licensed Civil Engineer, in accordance with California Business and Professions Code § 6735.

Roadway Improvements:



Zachary Oates, RCE No. C84705
Date: 3/31/2020

Bridge Improvements:



Brian Hansen, RCE No. C58976
Date: 6/30/2019
Drake Haglan and Associates



County of El Dorado, State of California Department of Transportation

Greenstone Road at Slate Creek Bridge Replacement

CIP No. 77137, Contract No. 3605

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**COUNTY OF EL DORADO, CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN by the County of El Dorado, State of California, that sealed bids for Work in accordance with the Project Plans (Plans) and Contract Documents designated:

**GREENSTONE ROAD AT SLATE CREEK BRIDGE REPLACEMENT PROJECT
CIP NO. 77137, CONTRACT NO. 3605**

Will be received by the Community Development Services, Department of Transportation, at the front counter of 2850 Fairlane Court, Building C, Placerville, California, until **March 28, 2019 at 2:00 PM**, at which time bids will be publicly opened and read by the County of El Dorado Community Development Services, Department of Transportation.

No Bid may be withdrawn after the time established for receiving bids or before the award and execution of the Contract, unless the award is delayed for a period exceeding sixty (60) calendar days. Bids must be executed in accordance with the instructions given and forms provided in the Contract Documents furnished by the County of El Dorado Community Development Services, Department of Transportation through Quest Construction Data Network (Quest). **The Proposal including the Bidder's Security shall be submitted in a sealed envelope clearly marked:**

**"PROPOSAL FOR GREENSTONE ROAD AT SLATE CREEK BRIDGE REPLACEMENT PROJECT"
CIP NO. 77137, CONTRACT NO. 3605
TO BE OPENED AT 2:00 P.M. ON March 28, 2019**

LOCATION/DESCRIPTION OF THE WORK: The Project is located along Greenstone Road, in the County of El Dorado. The Work to be done is shown on the Plans, and generally consists of, but is not limited to:

- A. Relocation and abandonment of an existing EID waterline, construction of a new cast-in-place concrete slab bridge over Slate Creek, removal of the existing structure and obliteration of the existing roadway alignment, grading and paving for the new bridge approaches and re-aligned roadway, guardrail and fence installation, roadway and ditch excavation, rock slope protection installation, signing and striping, and permanent erosion control installation. Other items or details not mentioned above, that are required by the plans, Standard Plans, Standard Specifications, or these Special Provisions must be performed, constructed or installed.
- B. Bids are required for the entire Work described herein.
- C. The Contract time is ONE HUNDRED SIXTY (160) WORKING DAYS.
- D. For bonding purposes the anticipated Project cost is less than \$2,750,000.
- E. A pre-bid meeting is scheduled for this Project on **March 20, 2019 at 2:00 p.m.** at the County of El Dorado Community Development Services, Department of Transportation, 2441 Headington Road, Placerville, CA. The meeting will be held in the downstairs conference room. Attendance at the pre-bid meeting is not mandatory.
- F. This Project is being formally bid in accordance with Public Contract Code 22032 and County of El Dorado Ordinance Code section 3.14.040.

OBTAINING OR VIEWING CONTRACT DOCUMENTS: The Contract Documents, including the Project Plans, may be viewed and/or downloaded from the Quest website at <http://www.questcdn.com>. Interested parties may also access the Quest website by clicking on the link next to the Project Name or entering the Quest Project #

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Contract No. 3605
March 5, 2019

County of El Dorado
Notice to Bidders
N-1

6043219 on the Community Development Services, Department of Transportation's website at <http://www.edcgov.us/Government/DOT/BidsHome.aspx>.

Interested parties may view the Contract Documents, including the Project Plans, on the Quest website at no charge. The digital Contract Documents, including the Project Plans, may be downloaded for \$10.00 by inputting the Quest Project # 6043219 on the websites' Project Search page. Please contact QuestCDN.com at (952) 233-1632 or info@questcdn.com for assistance in free membership, registration, downloading, and working with this digital project information.

To be included on the planholders list, receive notification of addenda, and to be eligible to bid interested parties must download the Contract Documents, including the Project Plans, from Quest. Those downloading the Contract Documents, including the Project Plans, assume responsibility and risk for completeness of the downloaded Contract Documents.

The Contract Documents, including the Project Plans, may be examined in person at the Community Development Services Department of Transportation office at 2850 Fairlane Court, Placerville CA. However, the Community Development Services Department of Transportation will no longer sell paper copies of the Contract Documents.

The cross sections and the following Supplemental Project Information/Information Handout will be provided in pdf format as part of the Contract Documents on Quest's website to all planholders who acquire the Contract Documents digitally through Quest:

- "Foundation Report, Greenstone Road Bridge Replacement Project," by Wreco, dated January 2018
- Greenstone Road Bridge Asbestos and Lead Based Paint Survey Report, County of El Dorado, CA, dated May 2018
- Applicable Caltrans Standard Plans

CONTRACTORS LICENSE CLASSIFICATION: Bidders must be properly licensed to perform the Work pursuant to the Contractors' State License Law (Business and Professions Code Section 7000 et seq.) and must possess a **CLASS A** license or equivalent combination of Classes required by the categories and type of Work included in the Contract Documents and Plans at the time the Contract is awarded, and must maintain a valid license through completion and acceptance of the Work, including the guarantee and acceptance period. Failure of the successful Bidder to obtain proper adequate licensing will constitute a failure to execute the Contract and will result in the forfeiture of the Bidder's security.

BUSINESS LICENSE: The County Business License Ordinance provides that it is unlawful for any person to furnish supplies or services, or transact any kind of business in the unincorporated territory of the County of El Dorado without possessing a County business license unless exempt under County Ordinance Code Section 5.08.070. The Bidder to whom an award is made must comply with all of the requirements of the County Business License Ordinance, where applicable, prior to beginning Work under this Contract and at all times during the term of this Contract.

CONTRACTOR REGISTRATION: No contractor or subcontractor may bid on any public works project, be listed in a bid proposal for any public works project, or engage in the performance of any contract for public work unless registered with the Department of Industrial Relations pursuant to Labor Code sections 1725.5 and 1771.1.

An inadvertent error in listing a subcontractor who is not registered pursuant to Section 1725.5 in a bid proposal shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the requirements of Labor Code section 1771.1 are met.

SUBCONTRACTOR LIST: Each Proposal must have listed therein the name, contractor's license number and address of each subcontractor to whom the bidder proposes to subcontract portions of the Work in an amount in excess of 0.5% of the total bid or \$10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The Bidder must also describe in the Subcontractor List the Work to be performed by each subcontractor listed. The Work to be performed by the subcontractor must be shown by listing the bid item number, bid item description, and portion of

the Work to be performed by the subcontractor in the form of a percentage (not to exceed 100%) calculated by dividing the Work to be performed by the subcontractor by the respective bid item amount(s) (not by the total bid price).

The percentage of each bid item subcontracted may be submitted with the Bidder's bid or sent via email or fax to Brian Franklin, County of El Dorado Department of Transportation, email- Brian.Franklin@edcgov.us, Fax-(530) 626-0387 by 4:00 p.m. on the first business day after the bid opening. The email or fax must contain the name of each subcontractor submitted with the Bidder's bid along with the bid item number, the bid item description, and the percentage of each bid item subcontracted, as described above. At the time the contract is awarded, all listed subcontractors must be properly licensed to perform their designated portion of the Work. The bidder's attention is directed to other provisions of the Act related to the imposition of penalties for failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

An inadvertent error in listing the California Contractor license number on the Subcontractor List will not be grounds for filing a bid protest or grounds for considering the bid non-responsive if the Bidder submits the corrected contractor's license number to Brian Franklin via fax or email as noted above within 24 hours after the bid opening, provided the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

BUY AMERICA: This Project is subject to the "Buy America" provisions of the Surface Transportation Assistance Act of 1982, as amended by the Intermodal Surface Transportation Efficiency Act of 1991, and the Moving Ahead for Progress in the 21st Century Act (MAP-21).

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION: For Federal-aid projects, DBE requirements of Title 49 Part 26 of the Code of Federal Regulations (49 CFR 26) apply. Bidders are advised that, as required by Federal law, the County of El Dorado has implemented Disadvantaged Business Enterprise requirements for Disadvantaged Business Enterprises (DBE). Comply with Section 2-1.12 and Section 5-1.13.

Bidder will take all necessary affirmative steps to assure that minority firms, women's business enterprises and labor surplus area firms are used when possible.

The Disadvantaged Business Enterprise (DBE) Contract goal is **13%**.

The UDBE Good Faith Effort Submittal Information Handout and the County of El Dorado DBE Training Presentation is available at <http://www.edcgov.us/Government/DOT/DBE.aspx>. The problems and solutions listed in the Handout apply to DBE Good Faith Efforts Submittals.

NONDISCRIMINATION: Comply with Chapter 5 of Division 4 of Title 2, California Code of Regulations and the following.

**NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM
(GOVERNMENT CODE SECTION 12990)**

Comply with Section 7-1.021(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.

Comply with the additional nondiscrimination and fair employment practices provisions in the *Draft Agreement* contained in these Contract Documents that will apply to this federal-aid Contract.

The Department of Transportation hereby notifies all Bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority 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, sex, national origin, religion, age, or disability in consideration for the award.

PREVAILING WAGE REQUIREMENTS: In accordance with the provisions of California Labor Code Sections 1770 et seq., including but not limited to Sections 1773, 1773.1, 1773.2, 1773.6, and 1773.7, the general prevailing rate of wages in the county in which the Work is to be done has been determined by the Director of the California Department of Industrial Relations. Interested parties can obtain the current wage information by submitting their requests to the Department of Industrial Relations, Division of Labor Statistics and Research, PO Box 420603, San Francisco CA 94142-0603, Telephone (415) 703-4708 or by referring to the website at <http://www.dir.ca.gov/OPRL/PWD>. The rates at the time of the bid advertisement date of a project will remain in effect for the life of the project in accordance with the California Code of Regulations, as modified and effective January 27, 1997.

Copies of the general prevailing rate of wages in the county in which the Work is to be done are also on file at the Department of Transportation's principal office, and are available upon request, and in case of projects involving federal funds, federal wage requirements as predetermined by the United States Secretary of Labor have been included in the Contract Documents. Addenda to modify the Federal minimum wage rates, if necessary, will be issued as described in the Project Administration section of this Notice to Bidders.

In accordance with the provisions of Labor Code 1810, eight (8) hours of labor constitutes a legal day's work upon all work done hereunder, and Contractor and any subcontractor employed under this Contract must conform to and be bound by the provisions of Labor Code Sections 1810 through 1815.

This Project is subject to the requirements of Title 8, Chapter 8, Subchapter 4.5 of the California Code of Regulations including the obligation to furnish certified payroll records directly to the Compliance Monitoring Unit under the Labor Commissioner within the Department of Industrial Relations Division of Labor Standards Enforcement in accordance with Section 16461.

In the case of federally funded projects, where federal and state prevailing wage requirements apply, compliance with both is required. This Project is funded in whole or part by federal funds. Comply with Exhibit D of the Draft Agreement and the Copeland Act (18 U.S.C. 874 and 29 CFR Part 3), the Davis-Bacon Act (40 U.S.C. 276a to 276a-7 and 29 CFR Part 5), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330 and 29 CFR Part 5).

If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, Contractor and subcontractors must pay not less than the higher wage rate. The Department of Transportation will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by Contractor and subcontractors, Contractor and subcontractors must pay not less than the federal minimum wage rate which most closely approximates the duties of the employees in question.

TRAINING: For the Federal training program, the number of trainees or apprentices is 2.

BID SECURITY: A bid security must be provided with each bid. Bid security must be in an amount of not less than ten percent (10%) of the total amount of the Bid for bid and must be cash, a certified check or cashier's check drawn to the order of the County of El Dorado or a Bidder's Bond executed by a surety satisfactory to the County of El Dorado **on the form provided in the Proposal section of these Contract Documents**.

BID PROTEST PROCEDURE: The protest procedure is intended to handle and resolve disputes related to the bid award for this Project pursuant to 2 Code of Federal Regulations Part 200.318(k) and County of El Dorado policies and procedures. A protestor must exhaust all administrative remedies with the County of El Dorado before pursuing a protest with a Federal Agency. Reviews of protests by the Federal agency will be limited to:

1. Violations of Federal law or regulations and the standards of 49 CFR Part 18 Section 18.36 (b) (12) (i)-(ii). Violations of State of California or local law will be under the jurisdiction of the State of California or the County of El Dorado; and

2. Violation of the County of El Dorado's protest procedures for failure to review a complaint or protest. Protests received by the Federal agency other than those specified above will be referred to the County of El Dorado.

The protest procedure is an extension of the formal bid process and allows those who wish to protest the recommendation of an award after bid the opportunity to be heard.

Policy: Upon completion of the bid evaluation, the Department of Transportation will notify all bidders of the recommendation of award, the basis therefore, and the date and time on which the recommendation for award will be considered and acted upon by the Board of Supervisors. All bidders may attend the Board of Supervisors meeting at the time the agenda item is considered, address the Board of Supervisors, and be heard.

Procedure: If a bidder wishes to protest the award, this is the procedure:

1. The Department of Transportation will review the bids received in a timely fashion under the terms and conditions of the Notice to Bidders, and notify the bidders in writing, at the fax number designated in the Proposal, of its recommendation including for award or rejection of bids ("All Bidders Letter").
2. Within two (2) business days from the date of the "All Bidders Letter," the Bidder protesting the recommendation for award must submit a letter of protest to and must be received by the County of El Dorado Department of Transportation, Attention Brian Franklin, 2850 Fairlane Court,, Placerville, CA 95667, and state in detail the basis and reasons for the protest. The Bidder must provide facts to support the protest, including any evidence it wishes to be considered, together with the law, rule, regulation, or criteria on which the protest is based.
3. If Department of Transportation finds the protest to be valid, it may modify its award recommendations and notify all bidders of that decision. If the Department of Transportation does not agree with the protest, or otherwise fails to resolve the protest, the Department of Transportation will notify the bid protestor and all interested parties of its decision and the date and time that the recommendation for award will be agendized for the Board of Supervisors' consideration and action. The Department of Transportation will also include in its report to the Board of Supervisors the details of the bid protest.
4. The Bidder may attend the Board of Supervisors meeting at which the recommendation and bid protest will be considered. The Board of Supervisors will take comment from the Bidder, staff, and members of the public who wish to speak on the item. In the event that the Bidder is not in attendance at that time, the bid protest may be dismissed by the Board of Supervisors without further consideration of the merits; and

The decision of the Board of Supervisors on the bid protest will be final.

AWARD OF CONTRACT: Bids will be considered for award by the Board of Supervisors. The County of El Dorado reserves the right after opening bids to reject any or all bids, to waive any irregularity in a bid, or to make award to the lowest responsive, responsible Bidder and reject all other bids, as it may best serve the interests of the County.

As a condition of award, the successful Bidder will be required to submit bonds and evidence of insurance prior to execution of the Agreement by the County. Failure to meet this requirement constitutes abandonment of the Bid by the Bidder and forfeiture of the Bidder's security. Award will then be made to the next lowest, responsive, responsible Bidder.

Office Engineer must receive all required bid documents within five (5) business days of the notice of award letter.

RETAINAGE FROM PAYMENTS: The Contractor may elect to receive one hundred percent (100%) of payments due under the Contract from time to time, without retention of any portion of the payment by the County, by depositing securities of equivalent value with the County in accordance with the provisions of Section

22300 of the Public Contract Code. Securities eligible for deposit hereunder are be limited to those listed in Section 16430 of the Government Code, or bank or savings and loan certificates of deposit.

PROJECT ADMINISTRATION: Submit all Requests for Information (RFI) during the bid period on the Quest website under the Quest # 6043219 under "Project Q&A". If the response does not require an addendum, a response will be posted on the Quest website under the RFI under "Project Q&A". It is the bidders' responsibility to check this website under "Project Q&A" for responses to bidders' inquiries during the bid period. Addenda will be uploaded in pdf format to Quest's website and Quest will issue an automatic email notification to all planholders that have acquired the Contract Documents digitally through Quest. The list of planholders will be available on Quest's website under "View Planholders".

No oral responses to any questions concerning the content of the Contract Documents will be given. All responses will be in the form of written addenda to the Contract Documents or written responses to bidders' inquiries. Responses to bidders' inquiries and addenda will be posted on the Quest website as described above.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications, or estimate must be communicated as a bidder inquiry prior to bid opening. These inquiries or questions, submitted after bid opening will not be treated as a bid protest.

BY ORDER OF the Director of the Department of Transportation, County of El Dorado, State of California.

Authorized by the Board of Supervisors on March 5, 2019, at Placerville, California.

By _____
Rafael Martinez, Director
Department of Transportation

ORGANIZATION

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

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

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

STANDARD PLANS LIST

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

ABBREVIATIONS, LINES, SYMBOLS, AND LEGEND

| | |
|----------|-------------------------------------------|
| A3A | Abbreviations (Sheet 1 of 3) |
| A3B | Abbreviations (Sheet 2 of 3) |
| A3C | Abbreviations (Sheet 3 of 3) |
| A10A | Legend - Lines and Symbols (Sheet 1 of 5) |
| RSP A10B | Legend - Lines and Symbols (Sheet 2 of 5) |
| A10C | Legend - Lines and Symbols (Sheet 3 of 5) |
| A10D | Legend - Lines and Symbols (Sheet 4 of 5) |
| A10E | Legend - Lines and Symbols (Sheet 5 of 5) |
| A10F | Legend - Soil (Sheet 1 of 2) |
| A10G | Legend - Soil (Sheet 2 of 2) |
| A10H | Legend - Rock |

EXCAVATION AND BACKFILL

| | |
|------|---------------------------------------------------------------------------------------------------------------------|
| A62C | Limits of Payment for Excavation and Backfill – Bridge OBJECT MARKERS, DELINEATORS, CHANNELIZERS, AND BARRICADES |
| A73B | Markers |
| A73C | Delineators, Channelizers, and Barricades TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN |

| | |
|-----|----------------------------|
| T3A | Temporary Railing (Type K) |
| T3B | Temporary Railing (Type K) |

BRIDGE DETAILS

| | |
|----------|----------------|
| B0-1 | Bridge Details |
| RSP B0-3 | Bridge Details |
| B0-13 | Bridge Details |

JOINT SEALS

| | |
|-------|--------------------------------------------|
| B6-21 | Joint Seals (Maximum Movement Rating = 2") |
|-------|--------------------------------------------|

UTILITY OPENING

| | |
|-------|------------------------------|
| B7-10 | Utility Opening - Box Girder |
|-------|------------------------------|

BRIDGE METAL RAIL BARRIERS

| | |
|--------|---------------------------------------------|
| B11-68 | California ST-10 Bridge Rail (Sheet 1 of 3) |
|--------|---------------------------------------------|

Greenstone Road at Slate Creek Bridge Replacement Project
CIP No 77137, Contract No. 3605
March 5, 2019

County of El Dorado
Standard Plans List
SPL-1

**DIVISION I GENERAL PROVISIONS
1 GENERAL**

Add to section 1-1.01:

Nonstandard Bid Items and Applicable Sections

| Item Code | Item Description | Applicable Section |
|-------------------------------------|--------------------------------------------------|--------------------|
| 070030A | FIRE SAFETY PLAN | 7 |
| 072007A | EXCAVATION SAFETY | 7 |
| 120090A | CONSTRUCTION PROJECT INFORMATION SIGNS | 12 |
| 128651A | PORTABLE CHANGEABLE MESSAGE SIGN | 12 |
| 130580A | TEMPORARY WATER DIVERSION | 13 |
| 141000A | TEMPORARY FENCE (TYPE ESA) | 14 |
| 149001A | PREPARE ASBESTOS DUST MITIGATION PLAN | 14 |
| 170103A | REMOVE TREE | 17 |
| 210270A | ROLLED EROSION CONTROL PRODUCT (NETTING, TYPE B) | 21 |
| 210280A | ROLLED EROSION CONTROL PRODUCT (BLANKET, TYPE B) | 21 |
| 810170A | DELINEATOR (CLASS 1, TYPE E) | 81 |
| 810180A | DELINEATOR (CLASS 2, TYPE E) | 81 |
| EID WATERLINE RELOCATION WORK ITEMS | | |
| 208589A | 4-INCH BLOW OFF ASSEMBLY | 77 |
| 208590A | 12-INCH GATE VALVE | 77 |
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| 770600A | DISINFECTION | 77 |

Add to the table in section 1-1.06:

| Abbreviation | Meaning |
|--------------|-----------------------------------------|
| CVIN | Central Valley Independent Network, LLC |
| EID | El Dorado Irrigation District |
| SWD | Sign Working Day |
| USPS | United States Postal Service |

Replace the corresponding definitions in section 1-1.07B with:

Bid Item List: List of bid items and the associated quantities. The Proposal Pay Items and Bid Price Schedule in the Proposal section is the Bid Item List. The verified Bid Item List is Exhibit A Contractor's Bid and Bid Price Schedule in the fully-executed contract for the project.

Contract acceptance: County Clerk/Recorder's recordation of the executed written Notice of Acceptance of a completed Contract.

Department or Department of Transportation: The Department of Transportation in the County of El Dorado or Department of Transportation as defined in St & Hwy Code § 20 and authorized in St & Hwy Code § 90; its authorized representatives.

Engineer: The Director of Transportation for County of El Dorado, or authorized representative (Resident Engineer) responsible for the Contract's administration; the Resident Engineer's authorized representatives.

Federal-aid contract: Contract that has a Federal-aid project number on the cover of the book titled Contract Documents.

Informal-bid contract: Contract that is noted as informally bid in the *Notice to Bidders*.

Revised Standard Specifications: New or revised standard specifications. These specifications are in a section titled *Revised Standard Specifications* of a book titled *Contract Documents including Notice to Bidders, Special Provisions, Proposal, and Contract*.

Special Provisions: Specifications specific to the project. These specifications are in a section titled *Special Provisions* of a book titled *Contract Documents including Notice to Bidders, Special Provisions, Proposal, and Contract*.

State: The State of California, including its agencies, departments, or divisions, whose conduct or action is related to the work, or County of El Dorado, a political subdivision of the State, and its Department of Transportation

Structure Design: The Department of Transportation for County of El Dorado or Offices of Structure Design of the Department of Transportation.

Add to section 1-1.07B:

Contract approval: Execution of the Contract by the County of El Dorado.

Contract award package: The Notice of Award of Contract letter, two originals of the Agreement, Payment and Performance bond forms, and other forms the successful Bidder must complete for Contract Execution.

Contract Documents: See Article 2 "Contract Documents" of the Draft Agreement.

County: County of El Dorado, a political subdivision of the State of California.

Laboratory: The established laboratory of the County of El Dorado Department of Transportation or laboratories authorized by the Engineer to test materials and work involved in the contract.

Office Engineer: The Office Engineer in the County of El Dorado Department of Transportation or, depending on context, Caltrans Office Engineer

Proposal: The Proposal section of the Contract Documents book or the Bidder's bid.

Delete "estimated cost" in section 1-1.07B.

Add to section 1-1.11:

| Reference or agency or department unit | Web site | Address | Telephone no. |
|--------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------|----------------|
| County of El Dorado Department of Transportation | http://www.edcgov.us/DOT/ | 2850 Fairlane Court Placerville, CA 95667 | (530) 621-5900 |

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Replace the 3rd paragraph of section 2-1.06B with:

If an *Informational Handout* or cross sections are available you may view and/or download them at as described in the *Notice to Bidders*.

Replace “RESERVED” in section 2-1.08 with:

Section 2-1.08 applies to a Federal-aid contract.

Under 31 USC § 1352:

None of the funds appropriated by any Act may be expended by the recipient of a Federal contract, grant, loan, or cooperative agreement to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with:

- (1) The awarding of any Federal contract.
- (2) The making of any Federal grant.
- (3) The making of any Federal loan.
- (4) The entering into of any cooperative agreement.
- (5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, submit an executed certification and, if required, submit a completed disclosure form as part your Proposal.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal constitutes signature of the Certification.

The certification and disclosure of lobbying activities must be included in each subcontract and any lower-tier contracts exceeding \$100,000. Submit all disclosure forms regardless of tier, but not certifications.

You, your subcontractors, and any lower-tier contractors must file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form you, your subcontractors, and any lower-tier contractors previously filed. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

Replace “Bid Item List” in section 2-1.09 with:

Proposal Pay Items and Bid Price Schedule.

Replace the 2nd paragraph in section 2-1.10 with:

The Subcontractor List in the Proposal must show the name, contractor’s license number, address, and work portions to be performed by each subcontractor listed. The work portion to be performed must be Greenstone Road at Slate Creek Bridge Replacement Project County of El Dorado
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shown by listing the bid item number, bid item description, and portion of the work to be performed by the subcontractor in the form of a percentage (not to exceed 100%) calculated by dividing the work to be performed by the subcontractor by the respective bid item amount(s) (not by the total bid price).

An inadvertent error in listing the California Contractor license number on the Subcontractor List will not be grounds for filing a bid protest or grounds for considering the bid non-responsive if the Bidder submits the corrected contractor's license number to Brian Franklin via fax (530) 626-0387 or email Brian.Franklin@edcgov.us within 24 hours after the bid opening, provided the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

Add to section 2-1.12B(1):

The Contractor must also carry out applicable requirements of 2 CFR Part 200.321 in the award and administration of this UNITED STATES DEPARTMENT OF TRANSPORTATION (USDOT)-assisted Contract. The applicable requirements of 2 CFR Part 200.321 are as follows:

1. *Contracting with small and minority firms, women's business enterprise and labor surplus area firms.*
 - a. Contractor will take all necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible.
 - b. Affirmative steps must include:
 - i. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - ii. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
 - iii. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;
 - iv. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises;
 - v. Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce; and
 - vi. Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (a)(2) (i) through (v) of this section.

Bidder will take all necessary affirmative steps to assure that minority firms, women's business enterprises and labor surplus area firms are used when possible.

Add to section 2-1.12B(2):

Bidders other than the apparent low bidder, the 2nd low bidder, and the 3rd low bidder are not required to submit the DBE commitment form unless the Department requests it. If the Department requests a DBE commitment form from you, submit the completed form within 4 business days of the request via email or fax to Office Engineer, email Brian.Franklin@edcgov.us, Fax (530) 626-0387.

Add to section 2-1.12B(3):

As provided in 49 CFR 26.53(d) if the Department determines that the apparent successful Bidder failed to meet the Good Faith Effort requirements, the Department will provide the apparent successful low

Bidder an opportunity for administrative reconsideration before awarding the Contract. The Department will provide the apparent successful low Bidder an opportunity to submit written documentation or argument and meet in person with the reconsideration official concerning the issue of whether it met the goal or made adequate good faith efforts to do so. The reconsideration official is someone who did not participate in the original determination that the goal or good faith effort was not met.

Replace section 2-1.15 “DISABLED VETERAN BUSINESS ENTERPRISES” with:

2-1.15 RESERVED

Replace section 2-1.18 “SMALL BUSINESS AND NON-SMALL BUSINESS SUBCONTRACTOR PREFERENCES” with:

2-1.18 RESERVED

Replace section 2-1.27 “CALIFORNIA COMPANIES” with:

2-1.27 RESERVED

Replace section 2-1.33 with:

Except as noted below, complete all pages of the Proposal in the Contract Documents book and submit the completed Proposal with the Bidder’s Security as noted in the *Notice to Bidders*.

Submit the forms from the Proposal and form information at the times shown in the following table:

| Contract type | Forms to be submitted at the time of bid | Forms to be submitted and received no later than 24 hours after bid opening^a | Forms to be submitted and received no later than 4 p.m. on the 5th business day after bid opening^a |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All Contracts | All Proposal forms including Business name and address; bid item number and bid item description of subcontracted work on the Subcontractor List | <ul style="list-style-type: none"> Subcontractor name bid item number, bid item description shown on the Subcontractor List submitted with Proposal, and the percentage of each bid item^b Correction for incorrect Contractor License # on Subcontractor List submitted with Proposal | -- |
| Federal-aid Contracts Only | -- | -- | <ul style="list-style-type: none"> Local Agency Bidder - DBE – Commitment (Exhibit 15-G)^c DBE Information - Good Faith Efforts (Exhibit 15-H) and Documentation^c |

^aThe percentage of each bid item and the 15-G and 15-H forms may be submitted at the time of bid.

^bIf the information is not submitted at the time of bid email or fax to Office Engineer, email-Brian.Franklin@edcgov.us, Fax-(530) 626-0387. 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.

^cIf not submitted at the time of bid, applicable only to the apparent low bidder, 2nd low bidder, and 3rd low bidder. Submit via email or fax to Office Engineer, email-Brian.Franklin@edcgov.us, Fax-(530) 626-0387.

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

If an agent other than the authorized corporation officer or a partnership member signs the bid, submit a Power of Attorney authorizing the agent to sign on behalf of the principal with the bid. Otherwise, the bid may be disregarded as irregular or unauthorized.

Replace the 4th item of the 1st paragraph of section 2-1.34 with:

- (a) Bidder's bond signed by an authorized representative of a surety insurer who is licensed in California. The authorized representative's signature must be notarized and authorization documentation must be provided.

Delete the 5th item of the 1st paragraph and the 3rd paragraph of section 2-1.34.

Replace the last paragraph of section 2-1.34 with:

If using a bidders bond, you must complete the Bidder's bond form included in in the Contract Documents following the Proposal and submit it with your proposal.

Delete the 2nd paragraph of section 2-1.40.

Replace "Reserved" in section 2-1.44 with:

2-1.44 BID PROTEST PROCEDURE

The protest procedure is intended to handle and resolve disputes related to the bid award for this project pursuant to Title 2 Code of Federal Regulations Part 200.318(k) and County policies and procedures. A protestor must exhaust all administrative remedies with County before pursuing a protest with a Federal Agency. Reviews of protests by the Federal agency will be limited to:

1. Violations of Federal law or regulations and the standards of Title 2 Code of Federal Regulations Part 200.318(k). Violations of State of California or Local law will be under the jurisdiction of the State or County; and
2. Violation of County's protest procedures for failure to review a complaint or protest. Protests received by the Federal agency other than those specified above will be referred to County.

The protest procedure is an extension of the formal bid process and allows those who wish to protest the recommendation of an award after bid the opportunity to be heard.

Policy: Upon completion of the bid evaluation, the Department will notify all bidders of the recommendation of award, the basis therefore, and the date and time on which the recommendation for award will be considered and acted upon by the Board of Supervisors. All bidders may attend the Board of Supervisors meeting at the time the agenda item is considered, address the Board of Supervisors, and be heard.

Procedure: If you wish to protest the award, this is the procedure:

1. The Department will review the bids received in a timely fashion under the terms and conditions of the *Notice to Bidders*, and notify you in writing, at the fax number designated in the Proposal, of its recommendation including for award or rejection of bids ("All Bidders Letter").
2. Within two (2) business days from the date of the "All Bidders Letter," the Bidder protesting the recommendation for award must submit a letter of protest to and must be received by Office Engineer, Attention Brian Franklin, and state in detail the basis and reasons for the protest. The Bidder must provide facts to support the protest, including any evidence it wishes to be considered, together with the law, rule, regulation, or criteria on which the protest is based.

All bids will be compared on the basis of the Proposal Pay Items and Bid Price Schedule of the quantities of work to be done.

The lowest, responsive, responsible bidder will be the Bidder submitting the lowest additive total of all the bid items and meeting all other requirements. In the event of a discrepancy between the unit price bid and the extended unit total as stated on the Proposal, the Department uses the amount bid for the unit price in calculating the additive total of the bid items for purposes of award, including revisions by Addenda, and as specified in the Proposal instructions.

Replace section 3-1.05 with:

3-1.05 CONTRACT BONDS (PUB CONT CODE § 7103)

The successful Bidder must furnish two bonds:

1. Payment bond to secure the claim payments of laborers, workers, mechanics, or materialmen providing goods, labor, or services under the Contract. This bond must be in a sum not less than one hundred percent (100%) of the total amount payable by the terms of the contract, naming the County as obligee.
2. Performance bond to guarantee faithful performance of the Contract. This bond must be in a sum not less than one hundred percent (100%) of the total amount payable by the terms of the contract, naming the County as obligee.

The Payment and Performance Bond forms are included with the Draft Agreement section of the Contract Documents book. The Department furnishes the successful Bidder bond forms with the Contract award package.

Replace the 1st paragraph and the 1st item of the 2nd paragraph of section 3-1.06 with:

For a Federal-aid contract, the Contractor must be properly licensed as a contractor from contract award (Pub Cont Code § 20103.5) through completion and acceptance of the Work, including the guarantee period. Failure to obtain proper and adequate licensing for an award of a Contract constitutes a failure to execute the Contract and results in the forfeiture of the security of the bidder.

1. The Contractor must be properly licensed as a contractor from bid opening (Bus & Prof Code § 7028.15) through completion and acceptance of the Work, including the guarantee period. Failure to obtain proper and adequate licensing constitutes a failure to execute the Contract and results in the forfeiture of the security of the bidder.

Replace section 3-1.08 “SMALL BUSINESS PARTICIPATION REPORT” with:

3-1.08 RESERVED

Replace section 3-1.11 with:

3-1.11 COUNTY PAYEE DATA RECORD FORM

Complete and sign the County *Payee Data Record* form included in the Contract award package.

Replace section 3-1.18 with:

3-1.18 CONTRACT EXECUTION

The successful Bidder must sign the *Agreement*.

Deliver to Office Engineer:

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Use each DBE Subcontractor as listed on the Subcontractor List form and the Local Agency Bidder – DBE Commitment (Construction Contracts) Exhibit 15-G form unless you receive authorization for a substitution.

Replace the last sentence of the 6th paragraph of section 5-1.13B(1) with:

Submit the form with the final estimate acceptance statement, which accompanies the Proposed Final Pay Estimate.

Replace the 2nd sentence of the 7th paragraph of section 5-1.13B(1) with:

Submit the form with the final estimate acceptance statement, which accompanies the Proposed Final Pay Estimate.

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

DBEs must perform work or supply materials as listed in the Local Agency Bidder-DBE Commitment (Construction Contracts), Exhibit 15-G form.

Replace the 7th paragraph of section 5-1.13B(2) with:

Unless the Department authorizes (1) a request to use other forces or sources of materials or (2) a good faith effort for a substitution of a terminated DBE, the Department does not pay for work listed on the Local Agency Bidder-DBE Commitment (Construction Contracts), Exhibit 15-G form unless it is performed or supplied by the listed DBE or an authorized substitute.

Replace section 5-1.13C “DISABLED VETERANS BUSINESS ENTERPRISES” with:

5-1.13C RESERVED

Replace section 5-1.13D “NON-SMALL BUSINESSES” with:

5-1.13D RESERVED

Add to section 5-1.20B(1):

The Department has obtained and included in Appendix C:

- 1) U.S. Army Corps of Engineers Nationwide Permit Number 14.
- 2) Central Valley Regional Water Quality Control Board Clean Water Act 401 Technically Conditioned Water Quality Certification
- 3) California Department of Fish and Game Streambed Alteration Agreement.

Access must be provided to personnel from any of the above mentioned departments and agencies at all times to verify compliance with the permits.

Replace section 5-1.20B(4) with:

Before procuring material, disposing of material, or otherwise using non-highway property, obtain a written agreement from the property owner.

Add section 5-1.20B(5):

The Department has obtained easements from:

| APN | Temporary Construction Easement (TCE) | Slope and Drainage Easement (SDE) | Public Utility Easement (PUE) |
|------------|----------------------------------------------|------------------------------------------|--------------------------------------|
| 319-170-09 | | X | |
| 319-170-07 | X | X | X |
| 319-250-04 | X | | |
| 319-170-08 | X | X | |

Contractor must coordinate with property owner for APN 319-250-04 and 319-170-08 prior to removal of existing fence and prior to commencing work on private property. Property owner possess livestock on the property and arrangements for temporary fencing must be made prior to removal of the existing fence. Temporary fence shall be capable of containing livestock.

Add to the end of section 5-1.20E:

The local water authority is El Dorado Irrigation District.

Replace “Reserved” in section 5-1.20G with:

5-1.20G Coordination With Schools

You must provide written notice to the following schools at least one (1) week prior to the start of construction activities, any lane closures, detours, construction staging or any work that may affect traffic or pedestrians through the construction area:

El Dorado Union High School District
Stephen Wehr, Superintendent
4675 Missouri Flat Road
Placerville, CA 95667
530-622-5081
Fax 530-622-5087

Union Mine High School
Paul Neville, Principal
6530 Koki Lane
El Dorado, CA 95623
530-621-4003
Fax 530-622-6034

Mother Lode Union School District
Marcy Guthrie, Superintendent
3783 Forni Road
Placerville, CA 95667
530-622-6464

Indian Creek Elementary School
Rhonda White, Principal
6701 Green Valley Road
Placerville, CA 95667
530-626-0765
Fax 530-626-9695

Herbert Green Middle School
Leslie Redkey, Principal
6781 Forni Road
Placerville, CA 95667
530-622-4668
Fax 530-622-4680

Written notices must be approved by Engineer prior to being sent by Contractor. Allow 3 business days for Engineer’s review and approval.

Replace “Reserved” in section 5-1.20H with:

5-1.20H Coordination With Property Owners

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You must make every effort to communicate with adjacent property owners and tenants to inform them of required access for construction operations, and must give forty-eight (48) hours notice to the property owners and tenants when work is to be performed on their property.

Access to adjacent businesses must be maintained so that the businesses will remain open during all normal business hours.

Replace “Reserved” in section 5-1.20I with:

5-1.20I Coordination With Emergency Services

You must provide written notice to the following Emergency Services agencies prior to implementing any road closures or starting any work activities:

- El Dorado County Sheriffs Department
- El Dorado County Fire District
- Cal Fire

Written notices must be approved by Engineer prior to being sent by Contractor. Allow 3 business days for Engineer’s review and approval.

Replace the 7th paragraph of section 5-1.23B(2) with:

Allow 10 days for review. Allow 10 days for review for complete resubmitted drawings.

Replace the 2nd sentence of the 8th paragraph of section 5-1.23B(2) with:

Allow review time specified plus 10 days for each additional set.

Replace “RESERVED” in section 5-1.24 with:

5-1.24 COST PRINCIPLES

Comply with the Federal Acquisition Regulations in Title 48, CFR, Part 31 et seq. as applicable, regarding allowable elements of cost for the Work to be performed under this Contract.

- A. You and your subcontractors must comply with 2 CFR Part 225 (formerly OMBA-87), Cost Principles for State, Local And Indian Tribal Governments; with Federal administrative procedures pursuant to 2 CFR, Part 200, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments; and with Contract Cost Principles, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Parts 31 et seq., insofar as those regulations may apply. This provision applies to every sub-recipient receiving funds as a Contractor or subcontractor under this Contract.
- B. Any expenditures for costs for which you have received payment or credit that are determined by subsequent audit to be unallowable under 2 CFR Part 225, 48 CFR, Parts 31 et seq. or 2 CFR, Part 200 are subject to repayment to County.
- C. Travel and per diem reimbursements, if applicable, and third-party contract reimbursements to subcontractors will be allowable as project costs only after you incur and pay for those costs.
- D. Notwithstanding any other provision of the Contract Documents to the contrary, payments for mileage, travel or subsistence expenses, if applicable, for your staff or your subcontractors claimed for reimbursement must not exceed the lesser of (1) the rates to be paid to County employees under the current Board of Supervisors Travel Policy in effect at the time the expenses are incurred; or (2) the rates authorized to be paid to rank and file State employees under current State Department of Personnel Administration (DPA) rules. If the rates claimed are in excess of those authorized DPA rates, you are responsible for the cost difference, and you must reimburse County for any overpayments inadvertently within thirty (30) days of County’s demand.
- E. You and your subcontractors must establish and maintain accounting systems and records that properly accumulate and segregate funds received under this Agreement by line item. Your and your subcontractor’s accounting systems must conform to Generally Accepted Accounting Principles (GAAP), must enable the determination of incurred costs at interim points of completion, and must provide support for reimbursement of payment vouchers or invoices.

Add item 3 to the 1st paragraph of section 5-1.27B:

3. Closure of all other pending matters under this Contract.

Replace the opening phrase of the 2nd paragraph of section 5-1.27B with:

For at least 4 years after the later of these, retain cost records, including records of:

Replace Section 5-1.27C with:

5-1.27C Record Inspection, Copying, and Auditing

Make your records available for inspection, copying, and auditing by FHWA, the United States Department of Transportation, the Comptroller General of the United States, the State, County or their duly authorized representatives for the same time frame specified under section 5-1.27 B. The records of subcontractors and suppliers must be made available for inspection, copying, and auditing by FHWA, the United States Department of Transportation, the Comptroller General of the United States, the State, County or their duly authorized representatives for the same period. Make records available for examination during normal business hours at your principal place of business in California, for audit during normal business hours at this place of business. Provide office space, photocopies and other assistance to enable audit or inspection representatives to conduct these audits or inspections.

Incorporate this provision in any subcontract entered into as a result of this Contract. Require subcontractors to agree to cooperate with the listed agencies by making all appropriate and relevant Project records available to those agencies for audit and copying.

Replace section 5-1.27E with:

5-1.27E Change Order Bills

Maintain separate records for change order work costs. Submit paper copy change order bills.

Delete the 2nd and 3rd paragraphs of section 5-1.32:

Add to the end of section 5-1.32:

Personal vehicles of your employees must not be parked on the traveled way or shoulders, except for sections closed to traffic. Personal vehicles must not block residential driveways.

Add to the 3rd paragraph of section 5-1.36D.

Pothole all underground utilities prior to construction activities. Underground Service Alert Phone: 811

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Add to section 7-1.02A:

County is relying on Federal assistance or grants as well as on State funds for all or a portion of the funding for the Work to be provided under this Contract. As a requirement of County's use of Federal and State funds, County is required to comply with certain Federal and State contracting requirements and to extend those requirements to its third party contracts. You must comply and must require your subcontractors to comply with all applicable provisions of Federal and State regulations, including those required by Caltrans and Federal Highway Administration (FHWA) grant funding requirements, regulations, and related executive orders regarding the use, expenditure, control, reporting, allowable costs and management of such funds as well as these requirements detailed in 2 CFR Part 200, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments. You must further comply with all applicable provisions of the Caltrans Local Assistance Procedures Manual and the Local Assistance Program Guidelines, all Title 23 Federal requirements, all 2 CFR Part 200 requirements and all applicable State and Federal laws, regulations and policy; procedural or instructional memoranda. Failure to comply with any Federal or State provision may be the basis for withholding payments and for such other remedies as may be appropriate including termination of this Contract. You must also comply with any flow-down or third-party contracting provisions which may be required under the Federal and State regulations and which may apply to your subcontracts, if any, associated with this Contract. You must ensure that all subcontractors submit certifications regarding Federal lobbying activities as required by Section 1352, Title 31, United State Code and that all such certifications are made a part of any subcontracts entered into as a result of this contract.

Replace section 7-1.02C "Emissions Reduction" with:

Section 7-1.02C Emissions Reduction

Sign the Emissions Reduction Certification in Article 13 "Emissions Reduction" of the Agreement.

Replace "Reserved" in section 7-1.02D with:

7-1.02D Reporting [2 CFR 200.328]

In order to monitor the progress of projects funded in whole or in part by Federal funds, Federal agencies rely heavily on inspection data. Inspections by the County will be performed on a regular basis and data compiled in report form, as necessary. Supply reporting information to County when requested.

Incorporate this provision in any subcontract entered into as a result of this contract.

Replace "Reserved" in section 7-1.02E with:

7-1.02E Copyrights, Trademarks, and Patents [2 CFR 200.315]

This project will be funded, in part, with Federal funds. The USDOT reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government proposes:

1. The copyright in any work developed under a grant, sub-grant, or contract under a grant or subgrant;

2. Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support; and
3. The patent rights to any discovery or invention which arises or is developed in the course of or under such contract.

Incorporate this provision in any subcontract entered into as a result of this contract.

Replace “Reserved” in section 7-1.02F with:

7-1.02F Clean Air Act and Clean Water Act [2 CFR 200-Appendix II to Part 200]

Comply with all applicable standards, orders or requirements issued under Section 306 of the Clean Air Act (42 U.S.C. 1857 [h]), Section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15).

Incorporate this provision in any subcontract entered into as a result of this contract.

Replace “Reserved” in section 7-1.02G with:

7-1.02G Energy Policy and Conservation Act [Public Law 94-163]

Comply with mandatory standards and policies relating to energy efficiency, which are contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (Pub. : 94-163, 89 Stat. 871).

Incorporate this provision in any subcontract entered into as a result of this contract.

Replace “Reserved” in section 7-1.02H with:

7-1.02H Rehabilitation Act of 1973 and American Disabilities Act of 1990

Comply with:

- Section 504 of the Rehabilitation Act of 1973 (Rehabilitation Act) which prohibits discrimination on the basis of disability in Federally assisted programs;
- The Americans with Disabilities Act (ADA) of 1990 which prohibits discrimination on the basis of disability irrespective of funding; and
- All applicable regulations and guidelines issued pursuant to both the Rehabilitation Act and the ADA.

Incorporate this provision in any subcontract entered into as a result of this contract.

Add to the end of section 7-1.02I(2):

You must comply and must require your subcontractors to comply with the Fair Employment Practices Addendum attached as Exhibit B to the Draft Agreement and the Nondiscrimination Assurances attached as Exhibit C to the Draft Agreement of the Contract Documents.

Replace item 1 of the 2nd paragraph of section 7-1.02K(2) with:

1. At the County of El Dorado Department of Transportation’s principal office, and are available upon request.

Add to the end of section 7-1.02K(2):

Copies of the general prevailing rate of wages in the county in which the Work is to be done are also on file at the Department of Transportation’s principal office, and are available upon request, and in case of

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projects involving Federal funds, Federal wage requirements as predetermined by the United States Secretary of Labor have been included in the Contract Documents. Addenda to modify the Federal minimum wage rates, if necessary, will be issued as described in the Project Administration section of this Notice to Bidders.

In the case of Federally funded projects, where Federal and State prevailing wage requirements apply, compliance with both is required. This project is funded in whole or part by Federal funds. Comply with Exhibit D of the Draft Agreement and the requirements of, and compliance with the Copeland Act (18 U.S.C. 874 and 29 CFR Part 3), the Davis-Bacon Act (40 U.S.C. 276a to 276a-7 and 29 CFR Part 5), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330 and 29 CFR Part 5).

If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, Contractor and subcontractors must pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by Contractor and subcontractors, Contractor and subcontractors must pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

Delete paragraphs 5 through 9 of section 7-1.02K(3).

Add to section 7-1.02K(4):

It is County policy to encourage the employment and training of apprentices on public works contracts as may be allowed under Local Apprenticeship Standards.

Add to section 7-1.02K(6)(b):

Interpret "signature" to mean signed and stamped by a registered professional engineer.

7-1.02K(6)(b)(i) Payment

The Department pays for preparing and submitting protection system shop drawings and installing, maintaining, and removing sheeting, shoring and bracing, sloping the sides of excavations, or equivalent method for excavations 5 feet deep and greater as Excavation Safety. The Engineer has the discretion to reduce payment where the need for excavation protection is indicated on the Plans but not required in the field.

Replace "Reserved" in section 7-1.02M(2) with:

Cooperate with local fire prevention authorities in eliminating hazardous fire conditions.

Submit a Fire Safety Plan prior to commencing work on the project. Include the phone numbers of the nearest fire suppression agency, California Department of Forestry and Fire Protection (Cal Fire) unit headquarters, United States Forest Service (USFS) ranger district office, and U.S. Department of Interior (USDI) BLM field office.

Immediately report to the nearest fire suppression agency fires occurring within the project limits.

Prevent project personnel from setting open fires that are not part of the work.

Prevent the escape of and extinguish fires caused directly or indirectly by job site activities.

Except for motor trucks, truck tractors, buses, and passenger vehicles, equip all hydrocarbon-fueled engines, both stationary and mobile including motorcycles, with spark arresters that meet USFS standards as specified in the *Forest Service Spark Arrester Guide*. Maintain the spark arresters in good

operating condition. Spark arresters are not required by Cal Fire, the BLM, or the USFS on equipment powered by properly maintained exhaust-driven turbo-charged engines or equipped with scrubbers with properly maintained water levels. The *Forest Service Spark Arrester Guide* is available at the district offices.

Each toilet must have a metal ashtray at least 6 inches in diameter by 8 inches deep half-filled with sand and within easy reach of anyone using the facility.

Locate flammable materials at least 50 feet away from equipment service, parking, and gas and oil storage areas. Each small mobile or stationary engine site must be cleared of flammable material for a radius of at least 15 feet from the engine.

Each area to be cleared and grubbed must be cleared and kept clear of flammable material such as dry grass, weeds, brush, downed trees, oily rags and waste, paper, cartons, and plastic waste. Before clearing and grubbing, clear a fire break at the outer limits of the areas to be cleared and grubbed. Other fire breaks may be ordered and are change order work.

Furnish the following fire tools:

1. 1 shovel and 1 fully charged fire extinguisher UL rated at 4 B:C or more on each truck, personnel vehicle, tractor, grader, or other heavy equipment.
2. 1 shovel and 1 backpack 5-gallon water-filled tank with pump for each welder.
3. 1 shovel or 1 chemical pressurized fire extinguisher, fully charged, for each gasoline-powered tool, including chain saws, soil augers, and rock drills. The fire tools must always be within 25 feet from the point of operation of the power tool. Each fire extinguisher must be of the type and size required by the Pub Res Code § 4431 and 14 CA Code of Regs § 1234. Each shovel must be size O or larger and at least 46 inches long.

Furnish a pickup truck and driver that will be available for fire control during working hours.

The pickup truck and operator must patrol the area of construction for at least 1/2 hour after job site activities have ended.

Cal Fire, USFS, and BLM have established the following adjective class ratings for 5 levels of fire danger for use in public information releases and fire protection signing: low, moderate, high, very high, extreme. Obtain the fire danger rating daily for the project area from the nearest Cal Fire unit headquarters, USFS ranger district office, or BLM field office.

Arrangements have been made with Cal Fire, USFS, and BLM to notify the Department when the fire danger rating is very high or extreme. This information will be furnished to the Engineer who will notify you for dissemination and action in the area affected. If a discrepancy between this notice and the fire danger rating obtained from the nearest office of either Cal Fire or USFS exists, you must conduct operations according to the higher of the two fire danger ratings.

If the fire danger rating reaches very high:

1. Falling of dead trees or snags must be discontinued.
2. No open burning is permitted and fires must be extinguished.
3. Welding must be discontinued except in an enclosed building or within an area cleared of flammable material for a radius of 15 feet.
4. Blasting must be discontinued.
5. Smoking is allowed only in automobiles and cabs of trucks equipped with an ashtray or in cleared areas immediately surrounded by a fire break unless prohibited by other authority.
6. Vehicular travel is restricted to cleared areas except in case of emergency.

If the fire danger rating reaches extreme, take the precautions specified for a very high fire danger rating except smoking is not allowed in an area immediately surrounded by a firebreak and work of a nature that

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could start a fire requires that properly equipped fire guards be assigned to such operation for the duration of the work.

The Engineer may suspend work wholly or in part due to hazardous fire conditions. The days during this suspension are non-working days.

If field and weather conditions become such that the determination of the fire danger rating is suspended, section 7-1.02M(2) will not be enforced for the period of the suspension of the determination of the fire danger rating. The Engineer will notify you of the dates of the suspension and resumption of the determination of the fire danger rating.

Replace the 15th paragraph of section 7-1.04 with:

Notify the Engineer 10 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

Add to the end of section 7-1.04:

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

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

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

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

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

Replace section 7-1.05 "Indemnification" with:

7-1.05 INDEMNIFICATION

Comply with Article 5 "Indemnity" of the Agreement.

Replace section 7-1.06 "INSURANCE" with:

7-1.06 INSURANCE

7-1.06A General Insurance Requirements

County will not execute this Contract and you are not entitled to any rights, unless certificates of insurances, or other sufficient proof satisfactory to County of El Dorado Risk Management Division that the following provisions have been complied with, and these certificate(s) are filed with the County.

Without limiting your indemnification required by Article 5 "Indemnity" of the Draft Agreement, you must procure and maintain and must require any of your subcontractors to procure and maintain for the duration of the Contract, including the one-year guarantee period, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by you, your agents, representatives, employees or subcontractors. Coverage must be at least as broad as:

Workers' Compensation as required by law in the State of California, with Statutory Limits, and Employer's Liability Insurance with a limit of no less than \$1,000,000 per accident for bodily injury or disease.

Commercial General Liability Insurance of not less than Four Million Dollars (\$4,000,000) aggregate limit and Two Million Dollars (\$2,000,000) combined single limit per occurrence for bodily injury and property damage, including but not limited to endorsements for the following coverage: Premises, personal injury, operations, products and completed operations, blanket contractual, and independent contractors liability. This insurance can consist of a minimum \$2 Million primary layer of CGL and the balance as an excess/umbrella layer, but only if the County is provided with written confirmation that the excess/umbrella layer "follows the form" of the CGL policy.

Automobile Liability Insurance of not less than One Million Dollars (\$1,000,000) is required in the event motor vehicles are used by the Contractor in performance of the Contract.

In the event Contractor is a licensed professional and is performing professional services under this Contract, Professional Liability Insurance is required with a limit of liability of not less than One Million Dollars (\$1,000,000).

Explosion, Collapse and Underground coverage is required when the scope of work includes XCU exposures. For the purpose of this Contract, XCU coverage is required.

7-1.06B Proof of Insurance Requirements

Furnish proof of coverage satisfactory to the County of El Dorado Risk Management Division as evidence that the insurance required herein is being maintained. The insurance must be issued by an insurance company acceptable to the Risk Management Division, or be provided through partial or total self-insurance likewise acceptable to the Risk Management Division.

The County of El Dorado, its officers, officials, employees, and volunteers must be included as additional insureds, but only insofar as the operations under this Contract are concerned. This provision applies to all general liability and excess liability policies. Proof that the County is named additional insured must be made by providing the Risk Management Division with a certified copy, or other acceptable evidence, of an endorsement to your insurance policy naming the County additional insured.

If you cannot provide an occurrence policy, provide insurance covering claims made as a result of performance of this Contract for not less than three (3) years following completion of performance of this Contract.

Any deductibles or self-insured retentions must be declared to and approved by the County. At the option of the County, either: the insurer must reduce or eliminate such deductibles or self-insured retentions as respects the County, its officers, officials, employees and volunteers; or the Contractor must procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Require each of your subcontractors to procure and maintain commercial general liability insurance, automobile liability insurance, and workers compensation insurance of the types and in the amounts specified above, or you must insure the activities of your subcontractors in your policy in like amounts. You must also require each of your subcontractors to name you and County of El Dorado, its officers, officials, employees, and volunteers as additional insureds.

7-1.06C Insurance Notification Requirements

You agree no cancellation or material change in any policy will become effective except upon prior written notice to the Community Development Services, Contract Services Unit, 2850 Fairlane Court, Placerville, CA 95667.

You agree that the insurance required herein will be in effect at all times during the term of this Contract. If this insurance coverage expires at any time or times during the term of this Contract, you must immediately provide a new certificate of insurance as evidence of the required insurance coverage. If you

Submit compatible software for the Engineer's exclusive possession and use.

Add to the 1st paragraph of section 8-1.02C(3)(a):

After authorization of the proposed software, submit schedule software and original software instruction manuals. The Engineer returns the schedule software to you before the final estimate. The Department pays you by force account for replacement of software or manuals damaged, lost, or stolen after submittal.

Replace "Reserved" in section 8-1.02C(3)(b) with:

8-1.02C(3)(b) Computer Software Training

Instruct the Engineer in the use of the software and provide software support until Contract acceptance.

Within 15 days after the date of the Notice of Award letter, provide a commercial training session for 2 Department employees in the use of the software at a location acceptable to the Engineer. For Primavera P6 software, the training session must be 8 hours. For other software, the training session must be 16 hours.

The Department recommends that you send at least 2 employees to the same training session to facilitate development of similar knowledge and skills in the use of the software.

Replace the 1st paragraph of section 8-1.02C(5) with:

Submit a baseline schedule and all support data within 20 days after the date of the Notice of Award letter. Allow 20 days for review after the submittal. The baseline schedule submittal is not complete until the computer software is installed for use. The Engineer will not postpone issuance of the Notice to Proceed if your baseline schedule submittal fails to meet the contract requirements requiring multiple submittals and reviews of your baseline schedule.

Replace the 1st and last sentences of the 1st paragraph of section 8-1.03 with:

Attend a pre-construction conference with key personnel, including all major superintendents for the work and if requested by the Engineer, major subcontractors. The pre-construction conference will be scheduled after the project is awarded and prior to the issuance of the Notice to Proceed. At this conference, submit in writing, signed by the officers of the corporation, if applicable, the names of two employees who will be the superintendents on the project. The second name serves as an alternate in the absence of the first designee. The superintendent must be on the site at all times that work is in progress.

With the exception of preparing and obtaining Department's authorization of the Storm Water Pollution Prevention Plan (SWPPP), or Water Pollution Control Program (WPCP), whichever is applicable, and preparing and obtaining Department's acceptance of the Critical Path Method (CPM) baseline schedule, any work performed in advance of the date stated in the Notice to Proceed is at your risk and as a volunteer. Submit a completed Subcontracting Request form, Exhibit 16-B of the Caltrans Local Assistance Procedures Manual (LAPM), or equivalent and obtain approval before beginning work on a subcontract. Comply with applicable parts of section 5-1.13B(1).

Delete "Partnering" from the table in section 8-1.03.

Add to section 8-1.03:

You must attend weekly meetings to discuss construction issues and scheduling.

Replace section 8-1.04B with:

The contract working days begin on the date stated in the Notice to Proceed. The total contract working days for this project is 160 days.

The Engineer will issue Notice to Proceed 10 days after Contract approval.

Do not start job site activities until the Department authorizes or accepts your submittal for:

1. CPM baseline schedule
2. SWPPP
3. Asbestos Dust Mitigation Plan
4. Asbestos Compliance Plan
5. Fire Safety Plan
6. Health & Safety Plan
7. Traffic Control Plan
8. Surface Water Diversion Plan

You may enter the job site only to measure controlling field dimensions and locating utilities.

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

1. *Notice of Materials To Be Used.*
2. Contingency plan for reopening closures to public traffic.

Replace the 1st paragraph of section 8-1.05 with:

Contract time starts on the day specified in section 8-1.04B.

Contract working hours are between the hours of 8:00 a.m. to 5:00 p.m. unless otherwise authorized.

Add to the end of section 8-1.06:

The Engineer may suspend work due to environmental permit restrictions and/or inclement weather.

If waterline relocation activities are not completed by July 31, 2019, then the Engineer may suspend the project prior to starting any work related to the bridge replacement and roadway realignment until after winter.

During the suspension, the Department pays for winterization costs or costs associated with water pollution control within the County's project area under the "Winterization" Bid Item. The Department pays for any other contract work required to be performed within the County's project area during the suspension under the applicable bid item.

Add to the end of section 8-1.10B:

Liquidated damages of \$4,800 per day applies to late opening of road closures beyond the allowable duration as specified in section 12-3.20A(1) and Chart 2 in section 12-4.02 in addition to not completing all contract work within the specified working days.

Replace "Reserved" in section 8-1.10D with:

8-1.10D Director Days

If the work is not completed within the working days, the Director may grant director days if it serves the Department's best interest.

12. 2-inch Air Release Valve
13. 4-inch Blow Off Assembly

Replace the last sentence of the 3rd paragraph of section 9-1.16E(2) with:

These amounts are shown on the *Pay Estimate*.

Replace the last sentence of the 1st paragraph of section 9-1.16E(3) with:

The documents include QC plans, required forms, schedules, traffic control plans, water pollution control submittals, and dust control submittals.

Add to the 1st paragraph of section 9-1.16E(3):

If you fail to comply with water pollution control or dust control requirements, the Department withholds part of the progress payment.

Replace the 2nd paragraph of section 9-1.16E(4) with:

Stop notice information may be obtained from the Engineer.

Replace section 9-1.16F with:

9-1.16F Retentions

9-1.16F(1) General

The Department will retain 5% of the value of each progress payment (excluding mobilization payments) from each progress payment. The Department will release retention incrementally (49 CFR 26.29) as follows:

1. When 25% of the total amount bid (excluding mobilization) has been completed, the Department will release all retention withheld up to this point;
2. When 50% of the total amount bid (excluding mobilization) has been completed, the Department will release all retention withheld since the previous release;
3. When 75% of the total amount bid (excluding mobilization) has been completed, the Department will release all retention withheld since the previous release.
4. The remaining retained funds shall be retained until thirty five (35) days after recordation of the Notice of Acceptance.

Work increments deemed complete by the Engineer under this section do not affect your other contractual obligations pertaining to that work, including the commencement of the warranty period or your obligation of maintenance and responsibility for that increment of work. Relief from maintenance and responsibility is at the discretion of the Engineer and must conform to the provisions of section 5-1.38.

You may elect to receive one hundred percent (100%) of payments due under the Contract from time to time, without retention of any portion of the payment by the County, by depositing securities of equivalent value with the County (Pub Cont Code 22300). Securities eligible for deposit hereunder are limited to those listed in Section 16430 of the Government Code, or bank or savings and loan certificates of deposit.

Funds retained from progress payments to ensure performance of the Contract that are eligible for payment into escrow or to an escrow agent pursuant to Section 22300 of the Public Contract Code do not include funds withheld or deducted from payment due to your failure to fulfill a contract requirement.

9-1.16F(2) Prompt Payment of Retained Funds to Subcontractors

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Replace Reserved in section 10-1.02A with:

Waterline relocation work must be completed prior to starting roadway and bridge construction.

Once roadway and bridge construction activities are ready to commence and all closure and detour signs are in place, then Greenstone Road may be fully closed through the project limits for the duration of construction activities. Access to properties adjacent to the project must be maintained at all times.

Add section 10-1.02F:

10-1.02F Pre-Construction Drainage Patterns

During construction maintain adequate drainage such that pre-construction drainage patterns are not compromised. The Engineer determines pre-construction drainage patterns.

Add to section 10-4:

Contractor is advised to conserve water. Contractor is advised the State has issued water conservation requirements. Contractor is responsible for contacting the local water authorities to determine any impacts the water conservation measures will have on various items of work.

Payment for any water conservation plan is included in the payment for various items of work.

Add to section 10-6:

You must contact El Dorado Irrigation District (EID) at (530) 622-4054 as to the availability of water sources for the Project work.

El Dorado Irrigation District (EID)
Main # 24 hr.: (530) 622-4513 (for emergency calls)
Attn: Mike Brink
2890 Mosquito Road
Placerville, CA 95667
(530) 642-4054
Fax (530) 642-4354

Temporary local water conservation measures may affect the supply of water during this project. It is your responsibility to plan for such impacts and meet the requirements of the Contract Documents.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

12 TEMPORARY TRAFFIC CONTROL

Add to section 12-1.01:

You must submit a Traffic Control Plan for review and approval. Your Traffic Control Plan must address each type of temporary traffic control system that will be used. Your Traffic Control Plan must include detailed controls, including flaggers, lane closures, PCMS boards, areas for trucks to enter and exit the construction area, and signs, as applicable. Your Traffic Control Plan must include signing required on intersecting streets and driveways within the area that will require traffic control as required. A Contingency Traffic Control Plan must be submitted with the Traffic Control Plan. Submit your Traffic Control Plan and Contingency Traffic Control Plan as early as five (5) working days after receipt of the Notice of Award but no later than two (2) days before the implementation of the Traffic Control Plan. No work will start on County roads until the Traffic Control Plan is approved. Violation of the Traffic Control requirements is justification for the Engineer to stop work until the requirements are met.

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Replace Item 1.3 of the 1st paragraph of section 12-3.01A(3) with:

- Contract number, CIP number, Caltrans district, county, route and post mile of project limits or County Road name.

Add between “retroreflective” and “orange” in the 1st sentence of the 4th paragraph of section 12-3.11B(1):

nonfluorescent

Replace “Reserved” in section 12-3.11B(5) with:

A construction project funding sign must comply with the details shown in Appendix E and on the Department's Traffic Operations website.

The sign must be a wood-post sign complying with section 82-3.

The sign panels must be framed, single-sheet aluminum panels (0.080” thickness) complying with section 82-2.

The background on the sign must be Type II retroreflective sheeting. The Type II retroreflective sheeting must be on the Authorized Material List for signing and delineation materials.

The legend must be retroreflective except for nonreflective black letters and numerals. The blue must match PR color no. 3 on FHWA's Color Tolerance Chart. The orange must match PR color no. 6 on FHWA's Color Tolerance Chart.

Add to section 12-3.20A(1):

Greenstone Road may be closed at the project site with the use of temporary railing (Type K), Type III barricades with flashing beacons, R11-2 signs mounted on barricades, and PCMS in accordance with sheet SC-1 and SC-2 of the project plans. The maximum duration of the full closure is 186 calendar days.

Replace “Reserved” in section 12-3.32(A)(2) of the RSS dated 04-15-16 with:

Sign working day (SWD): unit of measure for payment for PCMS – per sign per each day used.

Replace “Reserved” in section 12-3.32A(4) of the RSS dated 04-15-16 with:

Approaching drivers must be able to read the entire message at least 2 times before passing the portable changeable message sign at the posted speed limit. Use more than 1 portable changeable message sign to comply with this requirement if necessary.

Add to section 12-3.32C of the RSS dated 04-15-16:

Place and operate PCMS one (1) week in advance of any construction activities, to inform the public of upcoming contract work and related delays.

Place PCMSs at the locations shown and in advance of the 1st warning sign for each:

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

Approaching drivers must be able to read the entire message at least 2 times before passing the portable changeable message sign at the posted speed limit. Use more than 1 portable changeable message sign to comply with this requirement if necessary.

Replace section 12-3.32D with:

PCMS is measured in SWD. Portable changeable message signs at the project site but not in use will not be paid for.

Add to the end of section 12-4.01A:

Contractor will be allowed to utilize a stationary lane closure during waterline relocation work. One ten (10) foot travel lane shall be maintained at all times.

After waterline relocation work has been completed, Contractor may utilize a full road closure to complete the roadway and bridge work.

Add to section 12-4.02A(3)(a):

You must submit a Traffic Control Plan for review and approval. Your Traffic Control Plan must address each type of temporary traffic control system that will be used. Your Traffic Control Plan must include detailed controls, including but not limited to flaggers, lane closures, PCMS boards, and signs, as applicable. Your Traffic Control Plan must include signing required on intersecting streets and driveways within the area that will require traffic control as required and must address traffic control related to access to driveways for all residences. A Contingency Traffic Control Plan must also be submitted along with the Traffic Control Plan.

Submit your Traffic Control Plan as early as ten (10) working days after the receipt of the Notice of Award but no later than five (5) working days of receipt of Notice to Proceed. No work will start on County roads until the Traffic Control Plan is approved. Violation of the Traffic Control requirements is justification for the Engineer to stop work until the requirements are met.

Add between the 1st and 2nd paragraphs of section 12-4.02A(3)(c):

Submit a contingency plan for each of the following activities:

1. Activity requiring a complete roadway closure

Add between the 4th and 5th paragraphs of section 12-4.02C(1):

Not more than 1 stationary closure is allowed per direction of travel at one time.

Add to the end of section 12-4.02C(1):

During waterline relocation work, keep the full width of the traveled way open to traffic when no active construction activities are occurring in the traveled way or within 6 feet of the traveled way and on:

1. Designated holidays
2. Special days

During waterline relocation work, keep a minimum of 1 paved traffic lane at least ten (10) feet wide open for traffic.

Replace "Reserved" in section 12-4.02C(3)(f) with:

Closure restrictions for designated holidays and special days during waterline relocation work are shown in the following table:

| Lane Closure Restrictions For Designated Holidays And Special Days | | | | | | | | | | |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|-----|-----|
| Thu | Fri | Sat | Sun | Mon | Tues | Wed | Thu | Fri | Sat | Sun |
| x | H xx | xx | xx | | | | | | | |
| | SD xx | | | | | | | | | |
| x | xx | H xx | xx | | | | | | | |
| | | SD xx | | | | | | | | |
| | x | xx | H xx | xx | | | | | | |
| | | | SD xx | | | | | | | |
| | x | xx | xx | H xx | xxx | | | | | |
| | x | xx | xx | SD xx | xxx | | | | | |
| | | | | x | H xx | | | | | |
| | | | | x | SD xx | | | | | |
| | | | | | x | H xx | | | | |
| | | | | | | SD xx | | | | |
| | | | | | | x | H xx | xx | xx | xx |
| | | | | | | | SD xx | | | |
| Legend: | | | | | | | | | | |
| | Refer to lane requirement charts. | | | | | | | | | |
| x | The full width of the traveled way must be open for use by traffic after 1700. | | | | | | | | | |
| xx | The full width of the traveled way must be open for use by traffic. | | | | | | | | | |
| xxx | The full width of the traveled way must be open for use by traffic until 0800. | | | | | | | | | |
| H | Designated holiday | | | | | | | | | |
| SD | Special day | | | | | | | | | |

Replace "Reserved" in section 12-4.02C(3)(k) with:

Comply with the requirements for the conventional highway lane closures shown in the following chart:

| Chart No. 1 Conventional Highway Lane Requirements | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|----------------------------------|---|---|---|----|----|----|-------------------------|----|----|----|----|----|----|----|----|----|----|----|
| County: El Dorado | | | | | | | Route/Direction: Greenstone Road | | | | | | | Post Mile: 0.50 to 0.65 | | | | | | | | | | | |
| Closure limits: | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hour | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mon–Thu | | | | | | | | | | R | R | R | R | R | R | R | R | | | | | | | | |
| Fri | | | | | | | | | | R | R | R | R | R | R | R | R | | | | | | | | |
| Sat | | | | | | | | | | R | R | R | R | R | R | R | R | | | | | | | | |
| Sun | | | | | | | | | | R | R | R | R | R | R | R | R | | | | | | | | |
| Legend: | | | | | | | | | | | | | | | | | | | | | | | | | |
| R | Provide at least 1 through traffic lane not less than 10 feet in width for use by both directions of travel. (Reversing Control) | | | | | | | | | | | | | | | | | | | | | | | | |
| | Work is allowed within the highway where a shoulder or lane closure is not required. | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Lane closure requirements in this chart are intended for use during waterline relocation work. See Section 8-1.05 of these Special Provisions for allowable working hours. | | | | | | | | | | | | | | | | | | | | | | | | | |

Replace “Reserved” in section 12-4.02C(3)(I) with:

Comply with the requirements for the complete closure on a conventional highway shown in the following chart:

| Chart No. 2 Complete Conventional Highway Closure Hours | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---|---|---|---|---|----------------------------------------------------------|---|---|---|----|----|----|-------------------------|----|----|----|----|----|----|----|----|----|----|----|
| County: El Dorado | | | | | | | Route/Direction: northbound & southbound Greenstone Road | | | | | | | Post Mile: 0.51 to 0.76 | | | | | | | | | | | |
| Closure limits: Approx. 0.25 miles of Greenstone Road may be closed, from 0.20 miles north of and 0.05 miles south of the existing bridge. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hour | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| Mon–Thu | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| Fri | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| Sat | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| Sun | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C | C |
| Legend: | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | Conventional highway may be closed completely for a maximum duration of 186 calendar days. | | | | | | | | | | | | | | | | | | | | | | | | |
| | No complete conventional highway closure is allowed. | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> See Section 8-1.05 of these Special Provisions for allowable working hours. | | | | | | | | | | | | | | | | | | | | | | | | | |

Work shall be performed in low rainfall/dry weather only.

Add item 9 to the list in the 5th paragraph of section 13-1.03C:

9. Inspect sanitary and septic waste storage and monitor disposal procedures weekly.

Add to section 13-1.04:

The Department does not adjust the unit price for an increase or decrease in the water quality sampling and analysis day quantity. The Department does not adjust the unit price for an increase or decrease in the water quality monitoring report quantity.

Add to section 13-3.01A:

The project is Risk Level 2. The Central Valley RWQCB has issued a 401 Water Quality Certification for this project. A copy of this 401 Water Quality Certification is included in Appendix C of the Contract Documents. Contractor must comply with all conditions of the Certification. Contractor must maintain a copy of the Certification and supporting documentation at the project site during construction for review by site personnel and agencies. All personnel (employees, contractor, and subcontractors) performing work on the project must be adequately informed and trained regarding the conditions of this Certification.

The California Department of Fish and Wildlife has also issued a Streambed Alteration Agreement for this project. Copies of the Streambed Alteration Agreement, extensions and amendments to the Agreement, and California Environmental Quality Act documents must be readily available at the project site at all times and must be presented to Department personnel, or personnel from another State, Federal, or Local agency upon request.

Since the project will involve land disturbance activities of greater than one acre, the County shall obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2009-0009-DWQ for discharges to surface waters comprised of storm water associated with construction activity.

Allow at least 4 weeks for the Engineer to obtain a Notice of Intent (NOI) permit from the RWQCB after your submittal of the SWPPP to the Engineer has been approved.

Replace the 2nd paragraph of section 13-3.01A with:

Prepare storm water pollution prevention plan includes preparing SWPPP, obtaining SWPPP authorization for the Engineer to obtain coverage under the Permit and a Waste Discharge Identification Number (WDID) from RWQCB, amending the SWPPP, preparing a Construction Site Monitoring Program, providing a WPC Manager, conducting WPC training, and monitoring, inspecting, and reporting on WPC practices at the job site.

Replace the 1st sentence of the 1st paragraph of section 13-3.01C(2)(a) with:

Within 10 days of Contract approval submit 3 copies of your SWPPP for review. Allow 10 days for the Department's review. The Engineer provides comments and specifies the date when the review is stopped if revisions are required.

Add to the 6th paragraph of section 13-3.01C(2)(a):

The Engineer will not postpone issuance of the Notice to Proceed if your SWPPP submittal fails to meet the contract requirements requiring multiple submittals and reviews of your SWPPP.

Replace Item 5 of the 2nd paragraph of section 13-3.01B(2)(a) with:

5. Copy of County-furnished CEQA document and copy of permits obtained by the Department, including Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 certifications,

aerially deposited lead variance from the Department of Toxic Substance Control, aerially deposited lead variance notification, and RWQCB waste discharge requirements for aerially lead reuse.

Replace item 6 of the 7th paragraph in section 13-3.01B(2)(a) with:

- 6. There is a Permit violation

Replace section 13-3.01C(5) with:

13-3.01C(5) Reserved

Add to the beginning of the 1st sentence of the 1st paragraph of section 13-3.01C(2)(b)(vi)(B):

For Risk Level 2 and 3 projects,

Replace “Reserved” in section 13-3.01D(1) with:

Activities shall not cause turbidity increases in surface water to exceed:

- Where natural turbidity is < 1 NTU, controllable factors shall not cause downstream turbidity to exceed 2 NTUs
- Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU
- Where natural turbidity is > 100 NTUs, increases shall not exceed 10 percent

Activities shall not cause the pH in surface waters to be depressed below 6.5 nor raised above 8.5.

The WPC Manager must notify the Engineer immediately if the above criteria for turbidity, pH, or other water quality objectives are exceeded.

Add to section 13-3.01D(3)(a):

Surface water sampling must be performed:

- When performing in water work
- In the event that project activities result in any materials reaching surface waters
- When any activities result in the creation of a visible plume in surface waters

When one of the above criteria is triggered, the following sampling requirements shall be conducted upstream at the influence of the project, and approximately 300 feet downstream of the work area.

| Parameter | Unit | Type of Sample | Minimum Sampling Frequency | Required Analytical Test Method |
|------------------|----------------|-----------------------|------------------------------------|----------------------------------------|
| Turbidity | NTU | Grab | Every 4 hours during in-water work | (1, 2) |
| pH | Standard Units | Grab | Every 4 hours during in-water work | (1, 2) |

- (1) Pollutants shall be analyzed using the analytical methods described in 40 Code of Federal Regulations Part 136; where no methods are specified for a given pollutant, the method shall be approved by Central Valley Water Board staff.
- (2) A hand-held field meter may be used, provided the meter utilizes USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer’s instructions. A calibration and maintenance log for each meter used for monitoring shall be maintained onsite.

Add to section 13-3.03:

If the Engineer determines that resources sufficient to bring you into compliance with section 13 have not

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been allocated, the Engineer may redirect any of your resources available at the project site toward this effort. If the Engineer redirects resources due to your non-compliance with the provisions of section 13, the County will not be responsible for any delays to your schedule resulting from the reallocation, and no compensation will be made for these delays.

Install water pollution control (WPC) practices for erosion control and sediment control for areas under active construction. Limit active construction areas to the following as applicable:

1. By September 1 disturbed areas must not exceed the lesser of 50% of the total amount of area to be disturbed for the project or 10 acres
2. By September 15 disturbed areas must not exceed the lesser of 25% of the total amount of area to be disturbed for the project or 5 acres
3. By October 1 disturbed areas must not exceed the lesser of 10% of the total amount of area to be disturbed for the project or 2 acres
4. By October 15 disturbed areas must not exceed the lesser of 5% of the total amount of area to be disturbed for the project or 1 acre

During fall and winter do not exceed the specified amount of disturbance unless weather conditions permit and you request in writing and receive a waiver from the Engineer. Include in your request a contingency plan should weather conditions change.

Replace “upon Contract acceptance” in item 2 of the 1st paragraph and item 3 of the 2nd paragraph of section 13-3.04 with:

in the Proposed Final Pay Estimate

Delete item 2 of the 2nd paragraph of section 13-3.04.

Add to section 13-3.04:

The Department does not pay for implementation of WPC practices in areas outside the highway right-of-way not specifically provided for in the plans or in the special provisions.

Unless the WPC practice is required under section 13-4, the Department pays for WPC practices under section 9-1.04, excluding travel and subsistence allowances paid to workers.

The Department does not pay for WPC practices that the Engineer determines are installed for the purposes of conveying runoff as part of maintaining adequate drainage described in Section 10-1.02.

If you find it necessary to use WPC practices not specified to achieve compliance with Local, State, and Federal water pollution control regulations, then implementation, maintenance, and removal of the unspecified WPC practices will be at your expense.

The Department does not pay for the cleanup, repair, removal, disposal, or replacement of water pollution control practices due to improper installation or your negligence

The work to complete the final storm water annual report is excluded from section 5-1.46-

Add to the 4th paragraph of section 13-4.03B(1):

The WPC manager must notify the Engineer immediately of spills.

Replace the last paragraph of section 13-4.03C(1) with:

The following activities must be performed at least 300 feet from concentrated flows of stormwater, drainage courses, and inlets if within the floodplain and at least 300 feet if outside the floodplain, unless otherwise authorized:

1. Stockpiling of hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, temporary/portable sanitary facilities, or other construction-related potentially hazardous substances.
2. Fueling and maintaining vehicles and equipment

Refueling areas shall be provided with secondary containment including drip pans and/or placement of absorbent material. Contractor must perform frequent inspections of construction equipment prior to utilizing it near surface waters to ensure leaks from the equipment are not occurring and are not a threat to water quality.

Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to the stream must have secondary equipment at all times.

Replace "Reserved" in Section 13-4.03D(6) with:

13-4.03D(6) Spill Prevention Plan

Contractor must develop and maintain onsite a project-specific Spill Prevention, Containment, and Cleanup Plan outlining the practices to prevent, minimize, and/or clean up potential spills during construction. The Plan must detail the project elements, construction equipment types and location, access, access, and staging and construction sequence.

Replace "Reserved" in Section 13-4.03E(12) with:

13-4.03E(12) Temporary Diversions

13-4.03E(12)A General

If water is present, it must be diverted through or around the site prior to any work in Slate Creek.

Temporary surface water diversions are anticipated and must comply with the Streambed Alteration Agreement's Avoidance and Minimization Measures.

Permanent water diversion of flow from the receiving water is not allowed.

13-4.03E(12)B Definitions

Not used

13-4.03E(12)C Submittals

Develop, submit, and obtain approval of a Surface Water Diversion Plan from the Engineer. The Plan must include the proposed method and duration of diversion activities, structure configuration (including calculations and assumptions made to size diversion elements), construction materials, equipment, erosion and sediment controls, and a map or drawing indicating the location(s) of diversion and discharge points. The Plan must be consistent with the environmental permits obtained for the project.

Allow the Engineer two (2) business days to review the Surface Water Diversion Plan. Upon approval of the Surface Water Diversion Plan by the Engineer, the Plan will be submitted to the U.S. Army Corps of Engineers (USACE) and the California Department of Fish and Wildlife (CADFW) for review and approval prior to implementation of the Plan. Allow at least 4 weeks for the Engineer to obtain approval from the USACE and CADFW. Refer to Special Condition #1 of Nationwide Permit Number 14 and Avoidance and Minimization Measure 2.13 of the Streambed Alteration Agreement issued for the project.

13-4.03E(12)D Materials

Any temporary dam or other artificial obstruction constructed must only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which cause little or no siltation.

13-4.03E(12)E Construction

No more than two (2) days prior to implementation of any stream diversion, a survey shall be conducted by the County-supplied biologist to determine the presence of any salmonid fry, amplexing amphibians, tadpoles, egg masses, or other aquatic vertebrates. If egg masses or larva are present then diversion of

Add to the end of section 14-1.02:

Temporary Fence (Type ESA) must comply with section 80.

Add to section 14-2.01:

The Contractor must notify the County immediately upon discovery of any cultural materials or human remains.

In accordance with the California Health and Safety Code, if human remains are uncovered during construction at the project site, work within 50 feet of the remains must be suspended immediately, and the Department and the County Coroner must be notified immediately. Construction work in the vicinity of the burials will not resume until written authorization from the Engineer is given. Contractor must also comply with Public Resources Code Sections 5097.5 and 5097.9.

Add to the 1st paragraph of section 14-6.03A:

This project is within or near habitat for the regulated species shown below:

| Regulated Species |
|------------------------------------------------------------|
| California Red-Legged Frog (<i>Rana Aurora Draytoni</i>) |
| Foothill Yellow-Legged Frog (<i>Rana Boylii</i>) |
| Western Pond Turtle (<i>Actinemys Marmorata</i>) |

Add to section 14-6.03A:

ESA fencing must be placed to clearly delineate the limits of the work area, access routes, and staging areas. Fencing must be installed to confine work areas, access routes, and staging areas to the minimum area necessary to complete construction and minimize the potential impact to any regulated species in the surrounding areas.

Replace “Contractor-Supplied” to “County-Supplied” in every occurrence in Section 14-6.03D.

Delete the 4th paragraph in section 14-6.03D(1).

Add to section 14-6.03D(1):

A taking of any species listed in the California Endangered Species Act (CESA) or nesting birds as a result of Project activities is not authorized or allowed.

The County will retain the services of a qualified biologist to:

1. Provide one training session prior to the start of construction. The training session will be made available for attendance by contractor, employees of contractor, subcontractors, employees of subcontractor, consultants of contractor, county employees, county engineers, inspectors, consultants hired by the county. The biologist will provide one information package per attendee regarding species, habitats, and compliance with restrictions and guidelines.
2. Conduct preconstruction surveys.
3. Coordinate with County, RWQCB, USACE, and CDFW.
4. Mark buffer zones.
5. Develop plan to monitor the effects of the construction activities on the reproductive process of active nesting birds.

6. Determine when the young have fledged.

The County-supplied biologist's name and credentials shall be submitted to the USFWS for review and approval at least 15 days prior to the onset of construction activities.

The County-supplied biologist will perform a preconstruction survey for special status wildlife and nesting migratory birds no sooner than three (3) days prior to the start of construction activities. The survey will cover areas that could support nesting birds within 250 feet of the work area for special-status and migratory birds, within 500 feet of the work area for raptors, and within 0.25 miles of the work area for hawks.

Any active nests identified during the preconstruction survey will be marked and a non-disturbance buffer shall be established around the nest. If a lapse in project-related work of 15 calendar days or longer occurs, another survey shall be required before project work can begin again. If during the course of the project, an active nest is identified or becomes established that was not previously identified, it shall be marked and a buffer zone shall be established.

The County-supplied biologist has the authority to immediately stop any activity that is not in compliance with the RWQCB's 401 Water Quality Certification, CDFW Streambed Alteration Agreement, or USACE NWP No. 14, and/or to order any reasonable measure to avoid or minimize impacts to the fish and wildlife resources and based on the training provided.

If any special status wildlife is encountered during construction, work shall be suspended and CDFW shall be notified. Work shall not be re-initiated until the County has consulted with CDFW. Regardless of special status, all wildlife encountered during construction shall be allowed to leave the construction area unharmed.

Replace "RESERVED" in section 14-6.05 with:

14-6.05 Invasive and Special Plant Species

14-6.05A Invasive Plant Species

The contractor is required to implement the following measures to prevent the spread of invasive plant species into the project area:

- All equipment used for off-road construction activities will be weed-free prior to entering the project area.
- If project implementation calls for mulches or fill, they will be weed free.
- Any seed mixes or other vegetative material used for re-vegetation of disturbed areas will consist of locally adapted native plant materials.
- Staging area(s) boundaries will be delineated with ESA fencing to prevent.
- All areas of temporary disturbance will be re-vegetated and returned to pre-project conditions.

14-6.05B Special Plant Species

The County will retain the services of a qualified botanist to conduct pre-construction surveys to identify potential habitat (i.e. serpentine soils) for big-scale balsamroot, Jepson's onion, and Red Hills soaproot within the project area. Should individuals or populations of these special plant species be bound, the County will make the plant location(s) an avoidance area both in the field and on the plans. The contractor will be required to protect these areas with ESA fencing.

Replace section 14-8.02 with:

The work is located in a Rural Region with Low-Density Residential land use designation.

The following table specifies the maximum allowable noise exposure for work within the community types and land use designations listed above.

| MAXIMUM ALLOWABLE NOISE EXPOSURE FOR NONTRANSPORTATION NOISE SOURCES IN RURAL REGIONS—CONSTRUCTION NOISE | | | |
|-----------------------------------------------------------------------------------------------------------------|--------------------|-------------------------|------------------------|
| Land Use Designation | Time Period | Noise Level (dB) | |
| | | L_{eq} | L_{max} |
| All Residential (LDR) | 7 am–7 pm | 50 | 60 |
| | 7 pm–10 pm | 45 | 55 |
| | 10 pm–7 am | 40 | 50 |
| Commercial, Recreation, and Public Facilities (C, TR, PF) | 7 am–7 pm | 65 | 75 |
| | 7 pm–7 am | 60 | 70 |
| Rural Land, Natural Resources, Open Space, and Agricultural Lands (RR, NR, OS, AL) | 7 am–7 pm | 65 | 75 |
| | 7 pm–7 am | 60 | 70 |

The noise level requirements apply to the equipment on the job or related to the job measured at the affected building facade, including trucks, transit mixers or transient equipment that you may or may not own. Avoid the use of loud sound signals in favor of light warnings except those required by safety laws for the protection of personnel.

In the interest of the public safety and/or public convenience, the allowable noise levels may be waived.

Implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, shutting off idling equipment, rescheduling your activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources such that noise from construction does not exceed the limits specified above. If the existing background noise levels exceed the values above, then the limit for construction noise may be increased from the background noise level by the same percentage that the background noise level exceeds the values above.

Replace section 14-9.02 with:

Comply with applicable State and County Air Quality Management District (AQMD) rules and regulations regarding reduction of construction related impacts on air quality, including the implementation of the following measures:

- 7 Use low-emission onsite mobile construction equipment.
- 8 Maintain equipment in tune per manufacturer's specifications.
- 9 Retard diesel engine injection timing by two to four degrees unless not recommended by manufacturer (due to lower emission output in-place).
 1. Use reformulated low-emission diesel fuel.
 2. Substitute electric and gasoline-powered equipment for diesel-powered equipment where feasible.
 3. Use catalytic converters on gasoline-powered equipment.
 4. Do not leave inactive construction equipment idling for prolonged periods (i.e., more than 2 minutes).
 5. Support and encourage ridesharing and transit for the construction workers.
 6. All construction vehicles and equipment shall be fitted with working mufflers.

Replace “RESERVED” in section 14-9.04 with:

14-9.04 DUST CONTROL

14-9.04A GENERAL

14-9.04A(1) Summary

Section 14-9.04 includes specifications relating to dust control.

Comply with Rules 223. 223-1, and 223-2 (Dust Rules) of the Rules and Regulations of the El Dorado County Air Quality Management District (AQMD).

The Dust Rules can be obtained from the AQMD, 330 Fair Lane, Placerville, CA, 95667, (530) 621-6662, and are available at AQMD's website.

Materials within the project limits are known or suspected to contain naturally occurring asbestos and the project is located within designated Naturally Occurring Asbestos Review Areas on the current El Dorado County Naturally Occurring Asbestos Review Area Map. Test results indicate that the NOA appears to be restricted to roadcuts both north and south of the existing bridge and on the western side of Greenstone Road.

14-9.04A(2) Submittals

Submit a site specific Asbestos Dust Mitigation Plan (ADMP) to the AQMD meeting the requirements of Rule 223-2 for approval by the El Dorado County AQMD, prior to the start of any work. For projects exceeding 1 acre, where natural occurring asbestos is found to be present, the ADMP must comply with the State Asbestos Air Toxics Control Measure (CCR Title 17, Section 93105) and the County Ordinance (Chapter 8.44). Provide the Engineer with four (4) copies of the AQMD approved ADMP prior to the start of any work that may generate dust. The ADMP application can be found on AQMD's website at: http://www.edcgov.us/Government/AirQualityManagement/Construction_Dust_Rules.aspx.

Prepare an amendment to the ADMP when there is a change in construction activities or operations not included in the ADMP, or when your activities violate a condition of the AQMD, or when you are ordered by the Engineer. Amendments must identify additional dust control practices or revised activities, including those areas or activities not identified in the initially approved ADMP. Amendments to the ADMP must be prepared and submitted for review and approval within a time approved by the Engineer.

Keep one (1) copy of the approved ADMP and approved amendments at the project site. Make ADMP available upon request by a representative of the AQMD, California Air Resource Board, United States Environmental Protection Agency, or Caltrans. Requests by the public must be directed to the Engineer.

Provide all notices to the AQMD and create and maintain all records as required by Rule 223-2. Copies of all required records must be submitted to the Engineer within 30 calendar days of completion of all work subject to Rule 223-2.

Submit a dust control schedule that describes the timing of grading or other work activities that could promote dust to the Engineer prior to the start of any work. You must update the dust control schedule to reflect changes in your activities that would affect the implementation of necessary dust control practices.

14-9.04B Materials

Not used.

14-9.04C Construction

Implement the measures contained in the ADMP to control dust.

Control dust using measures that include the following:

1. Stabilize unpaved areas subject to vehicular traffic by keeping adequately wetted or covered with material that contains less than 0.25 percent asbestos.
2. The speed of vehicles and equipment traveling across unpaved areas must not be more than 15 mph unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment going faster from causing dust that is visible from crossing job site limits.

3. Stockpiles and disturbed areas not subject to vehicular traffic must be located in the plan and stabilized by being kept adequately wetted or covered with plastic sheeting, bonded fiber matrix, erosion control blanket or other WPC measures approved by the Engineer.
4. Conduct activities so that no dirt or mud tracking is visible on any paved roadway open to the public.
5. Use rock track out pads and wheel wash stations at all points of egress from unpaved construction areas.
6. Use a dedicated water truck for each piece of earthmoving equipment (e.g., scrapers, dozers, excavators, loaders, haul trucks, backhoes, compactors, graders, etc),
7. Pre-wet excavations to depths of cuts.

Dust control measures that will be required to mitigate dust may impact your productivity during construction activities.

Replace section 14-9.04D with:

14-9.04D PAYMENT

The Department does not pay for impacts to your productivity from mitigating dust from your activities.

Payment for preparing, obtaining approval for, revising, and amending the ADMP, for AQMD ADMP review fees, and for maintaining and submitting all dust control records is paid for under Prepare Asbestos Dust Mitigation Plan. Payment for performing dust control is not paid for under Prepare Asbestos Dust Mitigation Plan.

Replace section 14-10.02 with:

14-10.02 SOLID WASTE DISPOSAL AND RECYCLING REPORT

Submit a final solid waste disposal and recycling report (CEM-4401) upon completion of the work and prior to recordation of the Notice of Acceptance. Show the types and amounts of project-generated solid waste, including organic waste, taken to or diverted from landfills or reused on the Project. For failure to submit a completed report, the Department deducts \$1,500.

Replace section 14-11.05 with:

14-11.10 NATURALLY OCCURRING ASBESTOS

14-11.10A General

Section 14-11.10 includes specifications for managing Naturally Occurring Asbestos (NOA), serpentine and ultramafic rock. One or more of these materials are present within the job site. NOA is used as defined under 17 CA Code of Regs § 93105.

Comply with the Airborne Toxic Control Measures (ATCM) during all earthwork activities on the job site.

NOA exists in roadway slopes both north and south of the existing bridge and west of the existing roadway and south of Studebaker Road.

The tested levels of NOA range from undetectable to >10% asbestos as analyzed by California Air Resources Board (CARB) Test Method 435.

14-11.10A(1) Notifications

Notify the Air Pollution Control District (APCD) or Air Quality Management District (AQMD) in writing at least 15 days before starting work that disturbs NOA. Submit proof of notification and any exemption. Keep a copy at the job site.

14-11.10A(2) Submittals

14-11.10A(2)(a) Daily Ambient Air Monitoring Report

When required by local APCD or AQMD, perform daily ambient air monitoring on the job site. If daily ambient monitoring is required, submit a written air monitoring report to the Engineer every month. The report must include:

1. Air monitoring results
2. Analysis of results from the prior month
3. Name and location of the laboratory where the analysis was performed
4. Assessment of exposures of workers or the public
5. Descriptions of the type of air monitoring equipment
6. Sampling frequency

14-11.10A(2)(b) Asbestos Dust Mitigation Plan (ADMP)

Comply with section 14-9.04A(2).

14-11.10A(2)(c) Asbestos Compliance Plan

Submit the asbestos compliance plan (ACP) to prevent or minimize worker exposure to asbestos. The ACP must be signed by a CIH certified in Comprehensive Practice by the American Board of Industrial Hygiene.

The ACP must comply with the following regulations:

1. 8 CA Code of Regs, § 1529, (Asbestos) and § 5192, (Hazardous Waste Operations and Emergency Response)
2. Occupational Safety and Health Guidance Manual published by the National Institute of Occupational Safety and Health (NIOSH)
3. Occupational Safety and Health Administration (OSHA), including addenda issued up to and including the date of advertisement of the Contract

Include the following information in the ACP:

1. Identification of personnel designated to be on site
2. Job hazard analysis for work assignments
3. Summary of potential risks
4. Worker exposure air monitoring plan
5. Description of personal protective equipment
6. Delineation of work zones on the job site
7. Decontamination procedures
8. General safe work practices
9. Site security measures
10. Emergency response plans
11. Description of worker training

The ACP must also address the removal and disposal of Asbestos Cement Pipe as described in Section 77 of these Special Provisions.

14-11.10A(2)(d) Sampling and Analysis Plan

14-11.10A(2)(e) Fill Material Documentation

Submit documentation that fill material to be used as cover is asbestos free as defined by ATCM.

14-11.10A(2)(f) NOA Burial Location Report

Within 5 business days of completing placement of NOA at the burial location, submit a report for that burial location, including the form titled "Burial Location of Soil Containing Naturally Occurring Asbestos" and electronic geospatial vector data shape files of the top and bottom perimeters of the burial location to the Engineer.

The Engineer will notify you within 5 business days of receipt if accepted. If the report is rejected, you have 5 business days to submit a corrected report.

14-11.10A(2)(g) Disposal Documentation

Submit 1 copy each as an information submittal:

1. Bill of lading
2. Acknowledgement of receipt of material containing NOA from receiving party or landfill facility

For surplus NOA sent to a landfill facility also submit 1 copy each as an information submittal:

1. Landfill receipts showing the concentration of asbestos
2. Certified weight tickets showing the amount of disposal material containing NOA that was sent to the facility

If additional test results are required by the owner of the landfill facility, submit them as an information submittal.

14-11.10A(3) Quality Control and Assurance

Manage NOA under State laws and regulations and county and municipal ordinances and regulations. Laws and regulations that govern this work include:

1. 8 CA Code of Regs § 1529 (Asbestos) and § 5192 (Hazardous Waste Operations and Emergency Response)
2. 17 CA Code of Regs § 93105 and § 93106
3. 22 CA Code of Regs, Div 4,5, Chp 10
4. Health & Safety Code, Division 20, Chp 6.5 (Hazardous Waste Control)

Manage NOA under the rules and regulations of the following agencies:

1. US EPA
2. DTSC
3. CDPH
4. Cal/OSHA
5. CARB
6. El Dorado County Air Quality Management District (EDC AQMD)

14-11.10A(4) Training

Before performing work in areas with material containing NOA, personnel who have not had the worker training must complete a safety training program that complies with the ACP. The safety training program must meet the requirements of 8 CA Code of Regs §1529, (Asbestos), and § 5192 (b)(4)(B), (Hazardous Waste Operations and Emergency Response). Provide the Engineer written certification of completion of safety training for each trainee before performing work in areas containing NOA.

Provide training, personal protective equipment, and washing facilities for 5 Department employees.

14-11.10B Materials

Not Used

14-11.10C Construction

14-11.10C(1) General

Prevent visible dust emission during excavation, stockpiling, transportation, or placement of NOA under section 14-9.04 and 17 CA Code of Regs § 93105(d)(1)(B).

Comply with section 14-9.04C.

Do not leave NOA with asbestos content of 0.25 percent or higher exposed on the surface if disturbed during construction activities. Stabilize these areas by keeping them wetted or by treating them with a chemical dust palliative. Cover disturbed NOA permanently placed during construction activities with a 3-inch minimum layer of asbestos-free material.

NOA excavated material used for fill must be buried a minimum of 2 feet below finished grade.

Survey the location of the bottom and top perimeters of each area where you bury NOA.

The survey must be performed by or under the direction of either:

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

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

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

Material containing NOA may be temporarily stockpiled until it is transported and disposed of or used on site. Limit stockpile locations to areas that contain NOA within the job site. Cover temporary stockpiles with polyethylene sheeting of 10 mil minimum thickness or stabilize stockpiles by other methods permitted under 17 CA Code of Regs § 93105(d)(1)(3). Temporarily stockpiled material containing NOA is not selected material as specified in section 19-2.03D. NOA may be used as selected material as specified in section 19-2.03D only if buried at least 2 feet below finished grade.

14-11.10C(2) Material Transportation and Disposal

Do not dispose of material containing NOA in a surfacing application as defined in 17 CA Code of Regs § 93106, Asbestos Airborne Toxic Control Measure for Surfacing Applications.

Transport surplus NOA containing greater than or equal to 1.0 percent asbestos to an appropriately permitted landfill. You are responsible for identifying the appropriately permitted landfill to receive the

NOA. Surplus material containing less than 1.0 percent NOA may be disposed under Section 5-1.20B(4). In all cases of transporting and disposing of excess material containing NOA:

1. Use warning signs that the surplus material contains NOA.
2. Provide written notification of asbestos content to the party receiving the material, as defined in 17 CA Code of Regs § 93105(d)(3).
3. Obtain written acknowledgement, from the property owner or the landfill facility, that the surplus contains NOA.

Material containing NOA excavated from outside the limits of payment for verified bid items is the property of the Contractor and must be disposed of at an approved facility.

14-11.10C(3) Close-out

After you have completed managing NOA you have no further responsibility for the NOA in place within the job site. You will not be considered a generator of the hazardous material and no further action is required.

14-11.10D Payment

Not Used

Replace Section 14-11.12 with:

14-11.12 REMOVE YELLOW TRAFFIC STRIPE AND PAVEMENT MARKING WITH HAZARDOUS WASTE RESIDUE

14-11.12A General

14-11.12A(1) Summary

Section 14-11.12 includes specifications for removing existing yellow thermoplastic and yellow painted traffic stripe and pavement marking. The residue from the removal of this material is a Department-generated hazardous waste.

Residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking contains lead chromate. The average lead concentration is at least 1,000 mg/kg total lead or 5 mg/l soluble lead. When applied to the roadway, the yellow thermoplastic and yellow painted traffic stripe and pavement marking contained as much as 2.6 percent lead. Residue produced from the removal of this yellow thermoplastic and yellow painted traffic stripe and pavement marking contains heavy metals in concentrations that exceed thresholds established by the Health & Safety Code and 22 CA Code of Regs. For bidding purposes, assume the residue is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Work associated with disposal of hazardous waste residue regulated under RCRA as determined by test results is change order work.

Yellow thermoplastic and yellow paint may produce toxic fumes when heated.

14-11.12A(2) Submittals

14-11.12A(2)(a) General

Reserved

14-11.12A(2)(b) Lead Compliance Plan

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

14-11.12A(2)(c) Work Plan

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Submit a work plan for the removal, containment, storage, and disposal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The work plan must include:

1. Objective of the operation
2. Removal equipment
3. Procedures for removal and collection of yellow thermoplastic and yellow painted traffic stripe and pavement marking residue, including dust
4. Type of hazardous waste storage containers
5. Container storage location and how it will be secured
6. Hazardous waste sampling protocol and QA/QC requirements and procedures
7. Qualifications of sampling personnel
8. Analytical lab that will perform the analyses
9. DTSC registration certificate and CA Highway Patrol (CHP) Biennial Inspection of Terminals (BIT) Program compliance documentation of the hazardous waste hauler that will transport the hazardous waste
10. Disposal site that will accept the hazardous waste residue

Submit work plan to the Engineer within seven (7) days of Notice to Proceed with construction. The Engineer will review the work plan within 5 business days of receipt.

Do not perform work that generates hazardous waste residue until the work plan has been authorized.

Correct any rejected work plan and resubmit a corrected work plan within 5 business days of notification by the Engineer. A new review period of 5 business days will begin from date of resubmittal.

14-11.12A(2)(d) Analytical Test Results

Submit analytical test results of the residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking, including chain of custody documentation, for review and acceptance before:

1. Requesting the Engineer's signature on the waste profile requested by the disposal facility
2. Requesting the Engineer obtain an US EPA Generator Identification Number for disposal
3. Removing the residue from the site

14-11.12A(2)(e) U.S. Environmental Protection Agency Identification Number Request

Submit a request for the US EPA Generator Identification Number when the Engineer accepts analytical test results documenting that residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking is a hazardous waste.

14-11.12A(2)(f) Disposal Documentation

Submit documentation of proper disposal from the receiving landfill within 5 business days of residue transport from the project.

14-11.12B Materials

Not Used

14-11.12C Construction

Where grinding or other authorized methods are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking that will produce a hazardous waste residue, immediately contain and collect the removed residue, including dust. Use a HEPA filter-equipped vacuum attachment operated concurrently with the removal operations or other equally effective approved methods for collection of the residue.

Make necessary arrangements to test the yellow thermoplastic and yellow paint hazardous waste residue as required by the disposal facility and these Special Provisions. Testing must include:

1. Total lead by US EPA Method 6010B
2. Total chromium by US EPA Method 6010B
3. Soluble lead by California Waste Extraction Test (CA WET)
4. Soluble chromium by CA WET
5. Soluble lead by Toxicity Characteristic Leaching Procedure (TCLP)
6. Soluble chromium by TCLP

From the first 220 gal of hazardous waste or portion thereof if less than 220 gal of hazardous waste are produced, a minimum of 4 randomly selected samples must be taken and analyzed individually. Samples must not be composited. From each additional 880 gal of hazardous waste or portion thereof if less than 880 gal are produced, a minimum of 1 additional random sample must be taken and analyzed. Use chain of custody procedures consistent with chapter 9 of US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) while transporting samples from the project to the laboratory. Each sample must be homogenized before analysis by the laboratory performing the analyses. A sample aliquot sufficient to cover the amount necessary for the total and the soluble analyses must then be taken. This aliquot must be homogenized a 2nd time and the total and soluble analyses run on this aliquot. The homogenization process must not include grinding of the samples. Submit the name and location of the disposal facility that will be accepting the hazardous waste and the analytical laboratory along with the testing requirements not less than 5 business days before the start of removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The analytical laboratory must be certified by the State Water Resources Control Board (SWRCB) Environmental Laboratory Accreditation Program (ELAP) for all analyses to be performed.

After the Engineer accepts the analytical test results, dispose of yellow thermoplastic and yellow paint hazardous waste residue at a Class 1 disposal facility located in California under the requirements of the disposal facility operator within thirty (30)days after accumulating 220 pounds of residue and dust.

If less than 220 pounds of hazardous waste residue and dust is generated in total, dispose of it within thirty (30) days after the start of accumulation of the residue and dust.

The Engineer will sign all manifests as the generator within 2 business days of receiving and accepting the analytical test results and receiving your request for the US EPA Generator Identification Number. Use a transporter with a current DTSC registration certificate and that is in compliance with the CHP BIT Program when transporting hazardous waste.

14-11.12D Payment

If analytical test results demonstrate that the residue is a non-hazardous waste and the Engineer agrees, dispose of the residue at an appropriately permitted CA Class II or CA Class III facility. The Department does not adjust payment for this disposal.

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If removal of a buried man-made object is described, payment for removing the object encountered in an excavation is included in the type of excavation involved.

If removal of a buried man-made object is not described, payment for removing a buried man-made object is included in the type of excavation involved, unless before removal activities, (1) removing the object is ordered as change order work or (2) you request the removal to be change order work.

Add to section 19-2.04:

The Department does not pay for an excavation in excess of the limits shown or authorized.

Add to the end of section 19-3.01A:

Structure backfill includes constructing the geocomposite drain system. The systems must comply with section 68-7.

Expect difficult excavation due to water intrusion into excavations, presence of granular soils that include cobble and boulder size materials above planned footing elevations, variation in rock surface, and hard rock.

Contractor shall be made aware that the existing water line may be encountered during structure excavation at both abutment footings. Abandoned waterline piping encountered during structure excavation must be removed and disposed of in accordance with EID abandonment procedures and in accordance with section 77-2.01J of these Special Provisions.

Add to the beginning of section 19-3.03B(1):

For footings locations with structure excavation, ground or surface water is expected to be encountered but seal course concrete is not needed.

Add to the end section 19-3.03B:

19-3.03B(6) Rock

19-3.03B(6)(a) General

Section 19-3.03B(6) includes general specifications for performing Structure Excavation (Rock).

19-3.03B(6)(b) Construction

Excavate rock by using chemical expanders, pneumatic hammers, hydraulic splitters, or other authorized method to fracture rock and construct stable final rock cut faces. Blasting is not allowed.

Add to section 19-3.04:

Pervious backfill material placed within the limits of payment for bridges is paid for as structure backfill (bridge).

Replace "Reserved" in section 19-4 with:

19-4.01 GENERAL

19-4.01A Summary

Refer to the Geotechnical Reports provided as supplemental information to the Contract Documents. The conclusions and recommendations contained within the reports are based on limited study areas and may not be representative of the conditions you may encounter outside of the specific area of study. You are advised that in areas throughout the project site, hard, non-rippable rock exists that will require alternative excavation techniques, including the use of hydraulic rock breaking equipment, coring (for drilling operations), and/or chemical splitting agents.

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39-1.02A Geosynthetic Pavement Interlayer

Not Used

39-1.02B Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalts. Choose the type and grade. You must submit the type and grade to the County for review and approval prior to use.

You may not dilute asphaltic emulsion with water.

39-1.02C Asphalt Binder

Asphalt binder in HMA must comply with Caltrans' Certification Program for Suppliers of Asphalt. Program requirements, procedures, and a list of authorized material sources are online at the Caltrans Materials Engineering and Testing Services website:
<http://www.dot.ca.gov/hq/esc/Translab>.

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

It must comply with the requirements in the table in Section 92-1.02B of the Caltrans Standard Specifications.

39-1.02D Asphalt Rubber Binder

Not Used

39-1.02E Aggregate

Aggregate must be clean and free from deleterious substances.

The specified aggregate gradation must be determined before the addition of asphalt binder and includes supplemental fine aggregate.

The Department tests for aggregate grading under California Test 202, modified by California Test 105 if there is a difference in specific gravity of 0.2 or more between the coarse and fine parts of different aggregate blends.

Choose sieve size TV within each TV limit presented in the aggregate gradation tables.

Aggregate used in HMA Type A must comply with 1/2-inch HMA Type A gradation.

39-1.02E(1) HMA Type A

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

**Aggregate Gradation
(Percentage Passing)
HMA Types A**

| 1/2-inch HMA Types A and B | | |
|----------------------------|-----------|---------------------|
| Sieve sizes | TV limits | Allowable tolerance |
| 3/4" | 100 | — |
| 1/2" | 95–99 | TV ± 6 |
| 3/8" | 75–95 | TV ± 6 |
| No. 4 | 55–66 | TV ± 7 |
| No. 8 | 38–49 | TV ± 5 |
| No. 30 | 15–27 | TV ± 4 |

| | | |
|---------|---------|--------|
| No. 200 | 2.0–8.0 | TV ± 2 |
|---------|---------|--------|

39-1.02E(2) RHMA-G

Not Used

39-1.02E(3) OGFC

Not Used

39-1.02E(4) Aggregate Lime Treatment

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

| Quality characteristic | Test Method | HMA Type A |
|--------------------------------------------------------------------------------------------------------|------------------------|------------|
| Percent of crushed particles Coarse aggregate (% min.) One fractured face Two fractured faces | California Test 205 | 90 75 |
| Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face | | 70 |
| Los Angeles Rattler (% max.) Loss at 100 rev. Loss at 500 rev. | California Test 211 | 12 45 |
| Sand equivalent (min.) ^a | | 47 |
| Fine aggregate angularity (% min.) ^b | California Test 234 | 45 |
| Flat and elongated particles (% max. by weight @ 5:1) | California Test 235 | 10 |

39-1.02F Reclaimed Asphalt Pavement

39-1.02F(1) General

You may produce HMA Type A using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP at a substitution rate not exceeding 15 percent of the aggregate blend.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used.

Provide enough space for meeting RAP handling requirements at your facility. Provide a clean, graded, well-drained area for stockpiles. Prevent material contamination and segregation.

If RAP is from multiple sources, blend the RAP thoroughly and completely. RAP stockpiles must be homogeneous.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

39-1.02F(2) Substitution Rate of 15 Percent or Less

For a RAP substitution rate of 15 percent or less, you may stockpile RAP during the entire project.

39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS

39-1.03A General

The mix design process consists of performing California Test 367 and laboratory procedures on combinations of aggregate gradations and asphalt binder contents to determine the OBC and HMA mixture qualities. The results become the proposed JMF.

Use the *Contractor Hot Mix Asphalt Design Data* form to record aggregate quality and mix design data. Use the *Contractor Job Mix Formula Proposal* form to present the JMF.

Laboratories testing aggregate qualities and preparing the mix design and JMF must be qualified under the Department's Independent Assurance Program. Take samples under California Test 125.

The Engineer reviews the aggregate qualities, mix design, and JMF and verifies and authorizes the JMF.

You may change the JMF during production. Do not use the changed JMF until it is authorized. Except if adjusting the JMF as specified in section 39-1.03C, perform a new mix design and submit a new JMF submittal if you change any of the following:

1. Target asphalt binder percentage
2. Asphalt binder supplier
3. Asphalt rubber binder supplier
4. Component materials used in asphalt rubber binder or percentage of any component materials
5. Combined aggregate gradation
6. Aggregate sources
7. Substitution rate by more than 5 percent if your assigned RAP substitution rate is 15 percent or less
8. Average binder content by more than 2 percent from the average binder content of the original processed RAP stockpile used in the mix design
9. Maximum specific gravity of processed RAP by more than ± 0.060 from the average maximum specific gravity of processed RAP reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form
10. Any material in the JMF

For OGFC, submit a complete JMF submittal, except for asphalt binder content. 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.

39-1.03B Hot Mix Asphalt Mix Design

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

| Quality characteristic | Test Method | HMA Type A |
|------------------------|---------------------|------------|
| Air void content (%) | California Test 367 | 4.0 |

| | | |
|------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------|
| Voids in mineral aggregate (% min.) No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 17.0 15.0 14.0 13.0 |
| Voids filled with asphalt (%) No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 |
| Dust proportion No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 367 | 0.6–1.2 0.6–1.2 |
| Stabilometer value (min.) No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 366 | 30 37 |

The maximum allowable RAP binder replacement is 15 percent.

39-1.03C Job Mix Formula Submittal

Use a Department verified Job Mix formula that meets the contract specification requirements or a Job Mix Formula that has been previously approved by the Department within the last 12 months and also meets the contract specification requirements.

Each JMF submittal must consist of:

1. Proposed JMF on a *Contractor Job Mix Formula Proposal* form
2. Mix design records on a *Contractor Hot Mix Asphalt Design Data* form dated within 12 months of submittal
3. JMF verification on a *Caltrans Hot Mix Asphalt Verification* form, if applicable
4. JMF renewal on a *Caltrans Job Mix Formula Renewal* form, if applicable
5. MSDS for the following:
 - 5.1. *Asphalt binder*
 - 5.2. *Base asphalt binder used in asphalt rubber binder*
 - 5.3. *CRM and asphalt modifier used in asphalt rubber binder*
 - 5.4. *Blended asphalt rubber binder mixture*
 - 5.5. *Supplemental fine aggregate except fines from dust collectors*
 - 5.6. *Antistrip additives*

If the Engineer requests, sample the following materials in the presence of the Engineer and place in labeled containers weighing no more than 50 lb each:

1. **Aggregates:** Coarse, fine, and supplemental fine aggregate from stockpiles, cold feed belts, or hot bins. 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 fine aggregate. For hot-bin samples, the Department combines these aggregate samples to comply with the JMF TVs submitted on a *Contractor Job Mix Formula Proposal* form.
2. **RAP:** RAP from stockpiles or RAP system. Samples must be at least 60 lb.
3. **Asphalt Binder:** Take at least two 1 qt samples from binder supplier. Each sample must be in cylindrical-shaped cans with open top and friction lids.
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 and RAP, split the samples into at least 4 parts. Submit 3 parts to the Engineer and use 1 part for your testing.

39-1.03D Job Mix Formula Review

The County reviews each mix design and proposed JMF within 5 business days from the complete JMF submittal. The review consists of reviewing the mix design procedures and comparing the proposed JMF with the specifications.

The County may verify aggregate quality characteristics during this review period.

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39-1.03E Job Mix Formula Verification

Submit a Department-verified JMF on a *Caltrans Hot Mix Asphalt Verification* form dated within 12 months before HMA production.

Use the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. No adjustments to asphalt binder content are allowed. Based on your testing and production experience, you may submit an adjusted aggregate gradation TV on a *Contractor Job Mix Formula Proposal* form before verification testing. Aggregate gradation TV must be within the TV limits specified in the aggregate gradation tables. Asphalt binder set point for HMA must be the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form.

When RAP is used, asphalt binder set point for HMA must be:

$$\text{Asphalt Binder Set Point} = \frac{\frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)} - R_{RAP} \left[\frac{BC_{RAP}}{\left(1 - \frac{BC_{RAP}}{100}\right)} \right]}{100 + \frac{BC_{OBC}}{\left(1 - \frac{BC_{OBC}}{100}\right)}}$$

Where:

BC_{OBC} = optimum asphalt binder content, percent based on total weight of mix

R_{RAP} = RAP ratio by weight of aggregate

BC_{RAP} = asphalt binder content of RAP, percent based on total weight of RAP mix

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 cold feed belts or hot bins. Sample RAP from the RAP system. Sample HMA under California Test 125, except if you request and if authorized, you may sample from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 split parts and keep 1 part for your testing.

39-1.03F Job Mix Formula Renewal

Not Used.

39-1.03G Job Mix Formula Modification

Not Used.

39-1.03H Job Mix Formula Acceptance

You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications.

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2. The Department has verified the JMF within 12 months before HMA production.
3. The Engineer accepts the verified JMF.

39-1.04 CONTRACTOR QUALITY CONTROL

39-1.04A General

Establish, maintain, and change a quality control system to ensure materials and work comply with the specifications. Submit quality control test results within 3 business days of a request, except if the QC/QA construction process is specified.

You must identify the HMA sampling location in your QC plan. During production, take samples under California Test 125. You may sample HMA from:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

39-1.04B Prepaving Conference

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

39-1.04C Asphalt Rubber Binder

Not Used

39-1.04D Aggregate

Determine the aggregate moisture content and RAP moisture content in continuous mixing plants at least twice a day during production and adjust the plant controller. Determine the RAP moisture content in batch mixing plants at least twice a day during production and adjust the plant controller.

39-1.04E Reclaimed Asphalt Pavement

Perform RAP quality control testing each day.

For RAP substitution rate of 15 percent or less, sample RAP once daily.

Perform QC testing for processed RAP aggregate gradation under California Test 367, appendix B, and submit the results with the combined aggregate gradation.

39-1.04F Density Cores

Not Used

39-1.05 ACCEPTANCE CRITERIA

HMA acceptance is specified in the sections for each HMA construction process.

The County samples materials for testing under California Test 125 and the applicable test method, except samples may be taken:

1. At the plant from a truck or an automatic sampling device
2. From the mat behind the paver

Sampling must be independent of Contractor quality control, statistically based, and random.

If you request, the Department splits samples and provides you with a part.

HMA acceptance is based on:

1. Authorized JMF
2. Compliance with the HMA acceptance tables
3. Visual inspection

39-1.06 DISPUTE RESOLUTION

Work with the Engineer 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 quality control test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the independent third party participates in a dispute resolution, the party must be accredited under the Department's Independent Assurance Program. The independent third party must be independent of the project. By mutual agreement, the independent third party is chosen from:

1. Department laboratory
2. Department laboratory in a district or region not in the district or region the project is located
3. Transportation Laboratory
4. Laboratory not currently employed by you or your HMA producer

If split quality control or acceptance samples are not available, the independent third party uses any available material representing the disputed HMA for evaluation.

39-1.07 PRODUCTION START-UP EVALUATION

The Engineer evaluates 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 cold feed belts or hot bins. Take RAP samples from the RAP system. Sample HMA under California Test 125, except if you request and if authorized, you may sample HMA from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 split parts and keep 1 part.

39-1.08 PRODUCTION

39-1.08A General

Produce HMA in a batch mixing plant or a continuous mixing plant. Proportion aggregate by hot or cold feed control.

HMA plants must be Department qualified. Before production, the HMA plant must have current qualification under the Department's Materials Plant Quality Program.

During production, you may adjust hot or cold feed proportion controls for virgin aggregate and RAP.

During production, asphalt binder set point for HMA Type A must be the OBC shown in Contractor Hot Mix Asphalt Design Data form. For OGFC, asphalt binder set point must be the OBC shown on Caltrans Hot Mix Asphalt Verification form. If RAP is used, asphalt binder set point for HMA must be calculated as specified in section 39-1.03E.

For RAP substitution rate of 15 percent or less, you may adjust the RAP by -5 percent.

You must request adjustments to the plant asphalt binder set point based on new RAP stockpiles average asphalt binder content. Do not adjust the HMA plant asphalt binder set point until authorized.

39-1.08B Mixing

Mix HMA ingredients into a homogeneous mixture of coated aggregates.

Asphalt binder must be from 275 to 375 degrees F when mixed with aggregate.

Asphalt rubber binder must be from 350 to 425 degrees F when mixed with aggregate.

When mixed with asphalt binder, aggregate must not be more than 325 degrees F, except aggregate for OGFC must be not more than 275 degrees F. These aggregate temperature specifications do not apply if you use RAP.

HMA with or without RAP must not be more than 325 degrees F.

39-1.08C Asphalt Rubber Binder

Not Used

39-1.09 SUBGRADE AND TACK COAT

39-1.09A General

Prepare subgrade or apply tack coat to surfaces receiving HMA.

39-1.09B Subgrade

Subgrade to receive HMA must comply with the compaction and elevation tolerance specifications in the sections for the material involved. Subgrade must be free of loose and extraneous material. If HMA is paved on existing base or pavement, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping.

39-1.09C 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

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Before placing HMA, apply tack coat in 1 application. The application rate must be the minimum residual rate specified for the underlying surface conditions shown in the following tables:

Tack Coat Application Rates for HMA Type A, Type B, and RHMA-G

| HMA overlay over: | Minimum residual rates (gal/sq yd) | | |
|------------------------------------|--------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|
| | CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h asphaltic emulsion | CRS1/CRS2, RS1/RS2 and QS1/CQS1 asphaltic emulsion | Asphalt binder and PMRS2/PMCRS2 and PMRS2h/PMCRS2h asphaltic emulsion |
| New HMA (between layers) | 0.02 | 0.03 | 0.02 |
| PCC and existing HMA (AC) surfaces | 0.03 | 0.04 | 0.03 |
| Planed PCC and HMA (AC) surfaces | 0.05 | 0.06 | 0.04 |

For vertical surfaces, apply a residual tack coat rate that will thoroughly coat the vertical face without running off.

If you request and if authorized, 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 must be from 285 to 350 degrees F when applied.

39-1.10 SPREADING AND COMPACTING EQUIPMENT

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 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.

39-1.11 CONSTRUCTION

39-1.11A General

Do not pave HMA on wet pavement or a frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

Place additional HMA along the pavement's edge to conform to paved private roads and drives. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

39-1.11B Longitudinal Joints

39-1.11B(1) General

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

A vertical longitudinal joint of more than 0.15-feet is not allowed at any time between adjacent lanes open to traffic.

Place HMA on adjacent traveled way lanes so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place Kraft paper or another authorized bond breaker under the conform tapers to facilitate the taper removal when paving operations resume.

39-1.11B(2) Tapered Notched Wedge

Not Used

39-1.11C Widening Existing Pavement

If widening existing pavement, construct new pavement structure to match the elevation of the existing pavement's edge before placing HMA over the existing pavement.

39-1.11D Shoulders, Medians, and Other Road Connections

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions

4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

Pave shoulders and median borders adjacent to the lane before opening a lane to traffic.

39-1.11E Leveling

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as HMA (leveling).

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

39-1.11F Compaction

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 200 degrees F for RHMA-G

If a vibratory roller is used as a finish roller, turn the vibrator off.

Spread and compact HMA under sections 39-3.03 and 39-3.04 if any of the following applies:

1. Specified paved thickness is less than 0.15 foot.
2. Specified paved thickness is less than 0.20 foot and 3/4-inch aggregate grading is specified and used.
3. You spread and compact at:
 - 3.1. Asphalt concrete surfacing replacement areas
 - 3.2. Leveling courses
 - 3.3. Areas for which the Engineer determines conventional compaction and compaction measurement methods are impeded

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

39-1.12 SMOOTHNESS

39-1.12A General

Determine HMA smoothness with a profilograph and a straightedge.

39-1.12B Straightedge

The top layer of HMA pavement must not vary from the lower edge of a 12-foot straightedge:

1. More than 0.01 foot when the straightedge is laid parallel with the centerline
2. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
3. More than 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

39-1.12C Smoothness Correction

If the top layer of HMA Type A 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 choice of methods is authorized.

Measure the corrected HMA pavement surface with a 12-foot straightedge and correct the pavement to within specified tolerances. If a must-grind area or straightedge pavement cannot be corrected to within specified tolerances, remove and replace the pavement.

On areas ground but not overlaid with OGFC, apply fog seal coat under section 37-2.

39-1.13 HOT MIX ASPHALT ON BRIDGE DECKS

Not Used.

39-1.14 MISCELLANEOUS AREAS AND DIKES

Not Used.

39-1.15 MINOR HOT MIX ASPHALT

39-1.15A General

39-1.15A(1) Summary

Section 39-1.15 includes specifications for producing and placing minor hot mix asphalt.

Minor HMA must comply with section 39-1.01 except as specified in this section 39-1.15.

The inertial profiler requirements in section 36-3 do not apply.

39-1.15A(2) Definitions

Reserved

39-1.15A(3) Submittals

Not Used.

39-1.15A(4) Quality Assurance

39-1.15A(4)(a) General

Test pavement smoothness with a 12 foot straightedge.

39-1.15A(4)(b) Quality Control

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

39-1.15A(4)(c) Department Acceptance

The Department accepts minor HMA under section 39-1.15A(4)(c) except for compliance with requirements for the following quality characteristics:

1. Flat and elongated particles
2. Fine aggregate angularity
3. Hamburg wheel track

4. Moisture susceptibility

39-1.15B Materials

39-1.15B(1) General

Reserved

39-1.15B(2) Minor Hot Mix Asphalt Mix Design

The Hamburg wheel track and moisture susceptibility requirements do not apply to the mix design for minor HMA.

39-1.15B(3) Asphalt Binder

The grade of asphalt binder for minor HMA must be PG-64-10.

39-1.15B(4) Liquid Antistrip Treatment

Treat minor HMA with liquid antistrip unless you submit AASHTO T 283 and AASHTO T 324 (Modified) test results showing compliance with section 39-1.02 and dated within 12 months of the submittal.

39-1.15C Construction

Not Used

39-1.15D Payment

Not Used

39-1.16 RUMBLE STRIPS

Reserved

39-1.17 DATA CORES

Reserved

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

Reserved

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

Reserved

39-1.20 LIQUID ANTISTRIP TREATMENT

Reserved

39-1.21 REPLACE ASPHALT CONCRETE SURFACING

Reserved

39-1.22 LIQUID ASPHALT PRIME COAT

Reserved

39-1.23 HOT MIX ASPHALT TYPE C

Reserved

39-1.24 BONDED WEARING COURSE—GAP GRADED

Reserved

39-1.25 RUBBERIZED BONDED WEARING COURSE—GAP GRADED

Reserved

39-1.26 RUBBERIZED BONDED WEARING COURSE—OPEN GRADED

Reserved

39-1.27 BONDED WEARING COURSE—OPEN GRADED

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39-1.28 ROADSIDE PAVING

Reserved

39-1.29 SOIL TREATMENT

Reserved

39-1.30 EDGE TREATMENT, HOT MIX ASPHALT PAVEMENT

Not Used.

39-2 STANDARD CONSTRUCTION PROCESS

Not Used

39-3 METHOD CONSTRUCTION PROCESS

39-3.01 GENERAL

Section 39-3 includes specifications for HMA produced and constructed under the Method construction process.

39-3.02 ACCEPTANCE CRITERIA

39-3.02A Testing

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

HMA Acceptance—Method Construction Process

| Quality characteristic | Test method | HMA type | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| | | A | B | RHMA-G | OGFC |
| Aggregate gradation ^a | California Test 202 | JMF ± tolerance ^b | JMF ± tolerance ^b | JMF ± tolerance ^b | JMF ± tolerance ^b |
| Sand equivalent (min) ^c | California Test 217 | 47 | 42 | 47 | -- |
| Asphalt binder content (%) | California Test 379 or 382 | JMF±0.40 | JMF±0.40 | JMF ± 0.40 | JMF ± 0.40 |
| HMA moisture content (% max) | California Test 226 or 370 | 1.0 | 1.0 | 1.0 | 1.0 |
| Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 366 | 30 | 30 | -- | -- |
| | | 37 | 35 | 23 | -- |
| Percent of crushed particles Coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face | California Test 205 | 90 | 25 | -- | 90 |
| | | 75 | -- | 90 | 75 |
| | | 70 | 20 | 70 | 90 |
| Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev. | California Test 211 | 12 | -- | 12 | 12 |
| | | 45 | 50 | 40 | 40 |
| Air void content (%) ^{c, d} | California Test 367 | 4 ± 2 | 4 ± 2 | TV ± 2 | -- |
| Fine aggregate angularity (% min) ^e | California Test 234 | 45 | 45 | 45 | -- |

| | | | | | |
|---------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------|--------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Flat and elongated particles (% max by weight @ 5:1) | California Test 235 | Report only | Report only | Report only | Report only |
| Voids filled with asphalt (%) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | 65.0–75.0 65.0–75.0 65.0–75.0 65.0–75.0 | Report only | -- |
| Voids in mineral aggregate (% min) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading | California Test 367 | 17.0 15.0 14.0 13.0 | 17.0 15.0 14.0 13.0 | -- -- 18.0–23.0 18.0–23.0 | -- |
| Dust proportion ^f No. 4 and 3/8" gradings 1/2" and 3/4" gradings | California Test 367 | 0.6–1.2 0.6–1.2 | 0.6–1.2 0.6–1.2 | Report only | -- |
| Moisture susceptibility (minimum dry strength, psi) ^g | California Test 371 | 120 | 120 | -- | -- |
| Moisture susceptibility (tensile strength ration, %) ^g | California Test 371 | 70 | 70 | -- | -- |
| Smoothness | Section 39-1.12 | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind | 12-foot straight- edge and must-grind |
| Asphalt binder | Various | Section 92 | Section 92 | Section 92 | Section 92 |
| Asphalt rubber binder | Various | -- | -- | Section 92- 1.01D(2) and section 39-1.02D | Section 92- 1.01D(2) and section 39-1.02D |
| Asphalt modifier | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |
| CRM | Various | -- | -- | Section 39-1.02D | Section 39-1.02D |

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

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

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

^d The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^e The Engineer waives this specification if HMA contains 10 percent or less of non-manufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

^f Report only.

^g Applies to RAP substitution rate greater than 15 percent.

No single test result may represent more than 750 tons or 1 day's production, whichever is less.

For any single quality characteristic except smoothness, if 2 consecutive acceptance test results do not comply with the specifications:

1. Stop production.
2. Take corrective action.
3. Take samples and split each sample into 4 parts in the Engineer's presence. Test 1 part for compliance with the specifications and submit 3 parts to the Engineer. The Department tests 1 part for compliance with the specifications and reserves and stores 2 parts.
4. Demonstrate compliance with the specifications before resuming production and placement.

39-3.03 SPREADING AND COMPACTING EQUIPMENT

Each paver spreading HMA Type A must be followed by 3 rollers as follows:

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.

39-3.04 TRANSPORTING, SPREADING, AND COMPACTING

Pave HMA in maximum 0.25-foot thick and minimum 0.15-foot thick compacted layers.

If the surface to be paved is both in sunlight and shade, pavement surface temperatures must be taken in the shade.

Spread HMA Type A at the atmospheric and surface temperatures shown in the following table:

Minimum Atmospheric and Surface Temperatures

| Compacted layer thickness, feet | Atmospheric, °F | | Surface, °F | |
|---------------------------------|---------------------------|--------------------------------------|---------------------------|--------------------------------------|
| | Unmodified asphalt binder | Modified asphalt binder ^a | Unmodified asphalt binder | Modified asphalt binder ^a |
| | < 0.15 | 55 | 50 | 60 |
| 0.15–0.25 | 45 | 45 | 50 | 50 |

^a Except asphalt rubber binder.

If the asphalt binder for HMA Type A is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 250 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 200 degrees F
3. Finish compaction before the surface temperature drops below 150 degrees F

If the asphalt binder for HMA Type A is modified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
3. Finish compaction before the surface temperature drops below 140 degrees F

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.

Start rolling at the lower edge and progress toward the highest part.

Perform breakdown compaction of each layer of HMA Type A 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 thickness of the HMA layer is less than 0.08 foot, turn the vibrator off. The Engineer may order fewer coverages if the thickness of the HMA layer is less than 0.15 foot.

Perform intermediate compaction of each layer of HMA Type A with 3 coverages using a pneumatic-tired roller at a speed not exceeding 5 mph.

Perform finish compaction of HMA Type A with 1 coverage using a steel-tired roller.

Add to Section 39-3.04C(1):

Cold Plane existing asphalt surface as shown on the contract plans and as directed by the Engineer.

39-4 QUALITY CONTROL/QUALITY ASSURANCE CONSTRUCTION PROCESS

Not Used

39-5 EXISTING ASPHALT CONCRETE

39-5.01 GENERAL

39-5.01A General

Section 39-5.01 includes general specifications for performing work on existing asphalt concrete facilities.

Work performed on existing asphalt concrete facilities must comply with section 15.

39-5.01B Materials

Not Used

39-5.01C Construction

Before removing a portion of an asphalt concrete facility, make a 2-inch deep saw cut to a true line along the limits of the removal area.

39-5.01D Payment

Not Used

39-5.02 REPLACE ASPHALT CONCRETE SURFACING

39-5.02A General

Section 39-5.02 includes specifications for replacing asphalt concrete surfacing.

39-5.02B Materials

HMA to be used for replacing asphalt concrete surfacing must comply with Type A HMA as specified in sections 39-1.02E(1) and 39-1.03.

The grade of asphalt binder must be PG 64-10.

Tack coat must comply with section 39-1.09C.

39-5.02C Construction

Where replace asphalt concrete surfacing is shown, remove the full depth of the 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 you excavate the base beyond the specified plane, replace it with HMA.

Do not use a material transfer vehicle for replacing asphalt concrete surfacing.

Before placing HMA, apply a tack coat as specified in section 39-1.09C.

Place HMA using method compaction as specified in section 39-3.

39-5.02D Payment

The payment quantity for replace asphalt concrete surfacing is the volume determined from the dimensions shown.

39-5.03 REMOVE ASPHALT CONCRETE DIKES

Not Used

39-5.04 COLD PLANING ASPHALT CONCRETE PAVEMENT

39-5.04A General

Section 39-5.04 includes specifications for cold planing asphalt concrete pavement.

You will cold plane 0.17-feet of existing asphalt concrete surfacing in each section shown on the contract plans.

Cold planing asphalt concrete pavement includes the removal of pavement markers, traffic stripes, and pavement markings within the area of cold planing.

Submit a cold planing work plan. The work plan must include construction methods and address protecting the existing utility box structure shown in the plans.

39-5.04B Materials

HMA for temporary tapers must be of the same quality that is used for the HMA overlay or comply with the specifications for minor HMA in section 39-1.15.

39-5.04C Construction

39-5.04C(1) General

Before removing a portion of an asphalt concrete facility, make a 2-inch deep saw cut to a true line along the limits of the removal area.

Do not use a heating device to soften the pavement.

The cold planing machine must be:

1. Equipped with a cutter head width that matches the planing width unless a wider cutter head is authorized.
2. Equipped with automatic controls for the longitudinal grade and transverse slope of the cutter head and:
 - 2.1. If a ski device is used, it must be at least 30 feet long, rigid, and a 1-piece unit. The entire length must be used in activating the sensor.
 - 2.2. If referencing from existing pavement, the cold planing machine must be controlled by a self-contained grade reference system. The system must be used at or near the centerline of the roadway. On the adjacent pass with the cold planing machine, a joint-matching shoe may be used.
3. Equipped to effectively control dust generated by the planing operation
4. Operated such that no fumes or smoke is produced.

Replace broken, missing, or worn machine teeth.

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

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

39-5.04C(2) Grade Control and Surface Smoothness

Install and maintain grade and transverse slope references.

The final cut must result in a neat and uniform surface.

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

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

39-5.04C(3) Planed Material

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

39-5.04C(4) Temporary HMA Tapers

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

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

Completely remove temporary tapers before placing permanent surfacing.

39-5.04D Payment

Not Used

39-5.05 REMOVE BASE AND SURFACING

39-5.05A General

Section 39-5.05 includes specifications for removing base and asphalt concrete surfacing.

39-5.05B Materials

Not Used

39-5.05C Construction

Where base and surfacing are described to be removed, remove base and surfacing to a depth of at least 6 inches below the grade of the existing surfacing. Backfill resulting holes and depressions with embankment material under section 19.

39-5.05D Payment

The payment quantity for remove base and surfacing is the volume determined from the dimensions shown.

39-5.06–39-5.08 RESERVED

39-6 PAYMENT

Section 39-6 includes specifications for HMA payment. The weight of each HMA mixture designated in the Bid Item List must be 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 1st 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 weighmaster and submitted to the Engineer.

If tack coat, asphalt binder, and asphaltic emulsion are paid with separate contract items, their contract 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. Section 9-1.06 does not apply to tack coat.

**Replace section 77 with:
77-1 GENERAL**

77-1.01 GENERAL

77-1.01A Summary

Section 77-1 includes general specifications for constructing local infrastructure.

Local infrastructure must comply with the latest version of El Dorado Irrigation District's (EID) Technical Specifications, Standard Detail Drawings, and Water, Sewer, and Recycled Water Design & Construction Standards included in Appendix C.

For additional information, the latest copies can be found at: <https://www.eid.org/doing-business-with-eid/design-and-construction-standards>

77-1.02 MATERIALS

Not Used

77-1.03 CONSTRUCTION

Not Used

77-1.04 PAYMENT

Not Used

77-2 El Dorado Irrigation District Water System

77-2.01 GENERAL

77-2.01A Summary

Section 77-2 includes general specifications for installing El Dorado Irrigation District (EID) water lines.

77-2.01B Connection to Existing Water Line and Scheduled Shutdown

77-2.01B(1) General

Section 77-2.01B includes specifications for tying new water line facilities into existing El Dorado Irrigation District (EID) water lines as shown.

77-2.01B(2) Materials

Not Used

77-2.01B(3) Construction

Complete all tie-in work at the locations shown on the plans and in conformance with EID's Technical Specifications and Standard Detail Drawings.

Notify the Engineer, EID, and the Fire Department at least 2 weeks before the water shutdown for the tie-in at the four tie-in locations.

Complete all tie-in work at all 4 locations during a single, 8 hour shutdown of the existing water line. Tie-in work cannot be performed until the new water line has been qualified by EID staff.

77-2.01B(4) Payment

The contract lump sum prices paid for Tie-In 'A', Tie-In 'B', Tie-In 'C', and Tie-In 'D' shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in connecting the new waterline to the existing 12" AC waterline as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01C Ductile Iron Pipe

77-2.01C(1) General

Section 77-2.01C includes specifications for installing ductile iron pipe.

77-2.01C(2) Materials

Not Used

77-2.01C(3) Construction

Not Used

77-2.01C(4) Payment

The contract unit prices paid for 6-Inch Ductile Iron Pipe, 12-Inch Ductile Iron Pipe, and 12-Inch TR-Flex Ductile Iron Pipe shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in laying and connecting pipe lengths as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01D 22-Inch Steel Casing

77-2.01D(1) General

Section 77-2.01D includes specifications for installing the 22-inch steel casing.

Contractor is made aware of the presence fractured rock that may be encountered during installation of the 22-inch steel casing. Refer to the Foundation Report in the Supplemental Information for more detailed information.

77-2.01D(2) Materials

Not Used

77-2.01D(3) Construction

At Contractor's discretion, the 22-inch steel casing may be installed via directional drilling or an open-cut trench.

For an open-cut trench installation, contractor must construct a 60 ft x 4 ft x 0.33 ft thick concrete cap over the top of the 22-inch steel casing to protect from erosion.

For directional drilling installation, contractor must submit a Directional Drilling Work Plan that includes list of equipment, schedule of drilling activities, drilling fluid management plan, locations of sending/receiving pits, casing and pipeline assembly and installation procedures, and a detailed contingency plan addressing common problems encountered during drilling.

77-2.01D(4) Payment

The contract unit price paid for 22-Inch Steel Casing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in installing the 22-inch steel casing pipe as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

The contract unit price paid for 22-Inch Steel Casing shall include construction of a concrete cap if installed via an open-cut trench, and the submittal of a Directional Drilling/Boring Plan if you choose to install via horizontal directional drilling.

The contract lump sum price paid for Casing Sand shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in filling the annular space between the outside of the 12-Inch TR-Flex Ductile Iron Pipe and the inside of the 22-Inch Steel Casing and sealing the ends of the casing with concrete caps as shown on the Contract Plans, as specified in

these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01E Gate Valves

77-2.01E(1) General

Section 77-2.01E includes specifications for installing 6-inch and 12-inch gate valves on the new waterline.

77-2.01E(2) Materials

Not Used

77-2.01E(3) Construction

Gate valves must be installed in accordance with EID Technical Specifications and EID Standard Detail Drawing W12.

77-2.01E(4) Payment

The contract unit prices paid for 6-Inch Gate Valve and 12-Inch Gate Valve shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved installing the 6-inch and 12-inch gate valves as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01F 2-Inch Air Release Valve Assembly

77-2.01F(1) General

Section 77-2.01F includes specifications for installing 2-inch air release valve assemblies on the new waterline.

77-2.01F(2) Materials

Not Used

77-2.01F(3) Construction

The 2-inch air valve assemblies shown at station 'W' 1+16.50 on sheet W-1 and 'W' 7+25 on sheet W-2 of the plans must be constructed in accordance with EID Technical Specifications and EID Standard Detail Drawing W16.

77-2.01F(4) Payment

The contract unit prices paid for 2-Inch Air Release Valve Assembly shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved installing the 2-inch air release valve assemblies as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01G 4-Inch Blow Off Assembly

77-2.01G(1) General

Section 77-2.01G includes specifications for installing the 4-inch blow off assembly on the new waterline.

77-2.01G(2) Materials

Not Used

77-2.01G(3) Construction

The 4-Inch blow off assembly shown at station 'W' 3+13.90 on sheet W-1 of the plans must be constructed in accordance with EID Technical Specifications and EID Standard Detail Drawing W15B.

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77-2.01G(4) Payment

The contract unit price paid for 4-Inch Blow Off Assembly shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved installing the 4-inch blow off assembly as shown on the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01H Hydrostatic Pressure Testing

77-2.01H(1) General

Section 77-2.01H includes specifications for performing hydrostatic testing on the new waterline.

77-2.01H(2) Materials

Not Used

77-2.01H(3) Construction

Hydrostatic pressure testing must be performed in accordance with Section 33 13 10 *Water Piping System Testing* of EID's Technical Specifications.

77-2.01H(4) Payment

The contract lump sum price paid for Hydrostatic Pressure Testing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in the preparation and performance of the successful hydrostatic pressure testing of the waterline as described in the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01I Disinfection

77-2.01I(1) General

Section 77-2.01I includes specifications for disinfecting the new waterline.

77-2.01I(2) Materials

Not Used

77-2.01I(3) Construction

Disinfecting the water lines must be performed in accordance with Section 33 13 00 *Disinfecting Water Mains* of EID's Technical Specifications.

77-2.01I(4) Payment

The contract lump sum price paid for Disinfection shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in the preparation and performance of disinfecting the waterline as described in the Contract Plans, as specified in these Special Provisions, and as specified in EID's Technical Specifications and Standard Detail Drawings, and no additional payment shall be made therefor.

77-2.01J Abandon Existing Facilities

77-2.01J(1) General

Section 77-2.01J includes specifications for abandoning and disposing of the existing facilities, including asbestos cement pipe. Abandonment of facilities must be performed in accordance with Section 33 12 00.13 *Abandonment of Facilities* of EID's Technical Specifications.

77-2.01J(2) Submittals

Include the removal and disposal of Asbestos Cement Pipe (AC Pipe) with the Asbestos Compliance Plan (ACP) required in section 14-11.10A(2)(c) of these Special Provisions.

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77-2.01J(3) Training

Prior to performing work in areas containing or suspected to contain asbestos, personnel who have no prior training or are not current in their training status, including State personnel, must complete a safety training program provided by the Contractor, which meets the requirement of Title 8, California Code of Regulations, Section 1529. Provide a written certification of completion of safety training to the Engineer for trained personnel prior to performing work in areas containing or suspected to contain asbestos.

77-2.01J(4) Equipment and Medical Surveillance

Prepare a work plan for the removal, storage, transportation and disposal of AC Pipe. Removal and management of AC Pipe will be performed by a contractor registered pursuant to Section 6501.5 of the Labor Code and certified pursuant to Section 7058.6 of the Business and Professions Code. Asbestos removal must conform to Cal/OSHA requirements in Title 8 Sections 1529 and 341. For bridges built before 1980, where ACM is suspected, but cannot be sampled before demolition, a CAC must be present during demolition in case unforeseen ACM is encountered. Remove all friable material in a manner that conforms to OSHA work practice requirements. Remove and handle all non-friable ACM to prevent breakage. Non-friable ACM such as asbestos cement pipe must be disposed of to a landfill facility permitted to take ACM. The removal of ACM encased in concrete or other similar structural material is not required prior to demolition, but such material must be adequately wetted whenever exposed during demolition. Packaging, storage, transporting, and disposing of ACM, must conform to Title 22, Division 4.5, Chapters 11, 12 and 13 of the California Code of Regulations. No visible dust shall be generated by the handling, removing, transporting, and disposing of ACM.

Asbestos removal procedures include, but are not limited to:

1. Installing asbestos warning signs at perimeters of abatement work areas.
2. Wetting asbestos materials with sprayers.
3. Containing large volumes of asbestos materials in disposal bins for temporary storage until removed from the site.
4. Disposing of asbestos materials at a permitted disposal facility, which accepts such materials.
5. Working in accordance with Federal, State, and Local requirements for asbestos work.

Mark all vehicles used to transport ACM as specified below, or an equivalent warning:

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

77-2.01J(5) Materials

Not Used

77-2.01J(6) Construction

Abandonment of facilities must be performed in accordance with Section 33 12 00.13 *Abandonment of Facilities* of EID's Technical Specifications.

Haulers of friable asbestos containing material will have current registration with the State Department of Toxic Substances Control (DTSC), and must have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). A valid registration issued by DTSC is required for all vehicles used to transport hazardous waste material.

The Engineer will obtain the required EPA generator identification numbers, and will sign the hazardous waste manifests for disposal of friable asbestos containing material. You must dispose of friable and non-friable waste containing asbestos at a disposal facility permitted to accept such material and that meets all the requirements specified by Federal, State, and Local regulations. Notify the proper authorities at the disposal site in advance of delivery of asbestos containing material to the disposal site. Conduct additional sampling deemed necessary by the owner of the disposal facility for acceptance of the material at your expense.

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For concrete at abutments (footing, stem, backwall and wingwalls), the ratio of the quantity of free water to the quantity of cementitious material must not exceed 0.40.

Add to the end of section 90-1.02:

90-1.02K Polymer Fibers

Fibers must comply with ASTM D 7508. Microfibers must be from 1/2 to 2 inches long. Macrofibers must be from 1 to 2-1/2 inches long.

APPENDIX A

**To the Contract Documents for
Greenstone Road at Slate Creek Bridge Replacement Project
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Federal Aid No. BRLO – 5925(103)**

REVISED STANDARD SPECIFICATIONS

sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination.

2. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code, § 12900 et seq.), the regulations promulgated thereunder (Cal. Code Regs., tit. 2, § 11000 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Gov. Code, §§ 11135-11139.5), and the regulations or standards adopted by the awarding state agency to implement such article.
3. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding state agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, and all other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause.
4. Recipient, contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
5. The contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

Under 2 CA Code of Regs § 11122:

STANDARD CALIFORNIA NONDISCRIMINATION CONSTRUCTION CONTRACT SPECIFICATIONS (GOV. CODE SECTION 12990)

These specifications are applicable to all state contractors and subcontractors having a construction contract or subcontract of \$5,000 or more.

1. As used in the specifications:
 - a. "Act" means the Fair Employment and Housing Act.
 - b. "Administrator" means Administrator, Office of Compliance Programs, California Department of Fair Employment and Housing, or any person to whom the Administrator delegates authority;
2. Whenever the contractor or any subcontractor subcontracts a portion of the work, it shall include in each subcontract of \$5,000 or more the nondiscrimination clause in this contract directly or through incorporation by reference. Any subcontract for work involving a construction trade shall also include the Standard California Construction Contract Specifications, either directly or through incorporation by reference.
3. The contractor shall implement the specific nondiscrimination standards provided in paragraphs 6(a) through (e) of these specifications.
4. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer members of any group protected by the Act shall excuse the contractor's obligations under these specifications, Government Code section 12990, or the regulations promulgated pursuant thereto.5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained

pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.

6. The contractor shall take specific actions to implement its nondiscrimination program. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor must be able to demonstrate fully its efforts under steps a. through e. below:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and at all facilities at which the contractor's employees are assigned to work. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligations to maintain such a working environment.
 - b. Provide written notification within seven days to the director of the DFEH when the referral process of the union or unions with which the contractor has a collective bargaining agreement has impeded the contractor's efforts to meet its obligations.
 - c. Disseminate the contractor's equal employment opportunity policy by providing notice of the policy to unions and training, recruitment and outreach programs and requesting their cooperation in assisting the contractor to meet its obligations; and by posting the company policy on bulletin boards accessible to all employees at each location where construction work is performed.
 - d. Ensure all personnel making management and employment decisions regarding hiring, assignment, layoff, termination, conditions of work, training, rates of pay or other employment decisions, including all supervisory personnel, superintendents, general foremen, on-site foremen, etc., are aware of the contractor's equal employment opportunity policy and obligations, and discharge their responsibilities accordingly.
 - e. Ensure that seniority practices, job classifications, work assignments, and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the equal employment opportunity policy and the contractor's obligations under these specifications are being carried out.
7. Contractors are encouraged to participate in voluntary associations that assist in fulfilling their equal employment opportunity obligations. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on equal employment opportunity in the industry, ensures that the concrete benefits of the program are reflected in the contractor's workforce participation, and can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's.
8. The contractor is required to provide equal employment opportunity for all persons. Consequently, the contractor may be in violation of the Fair Employment and Housing Act (Government Code section 12990 et seq.) if a particular group is employed in a substantially disparate manner.
9. The contractor shall not use the nondiscrimination standards to discriminate against any person because race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status.
10. The contractor shall not enter into any subcontract with any person or firm decertified from state contracts pursuant to Government Code section 12990.
11. The contractor shall carry out such sanctions and penalties for violation of these specifications and the nondiscrimination clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Government Code section 12990 and its implementing regulations by the awarding agency. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Government Code section 12990.
12. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by OCP and to keep records. Records shall at

least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, status, (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

Add to the end of the 2nd sentence in the 1st paragraph of section 7-1.02K(1):

04-22-16

, and hauling and delivery of ready-mixed concrete.

Add between the 4th and 5th paragraphs of section 7-1.02K(3):

04-22-16

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

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

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

07-15-16

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

Temporary Tapers

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

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

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

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

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

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

12-3.32A(2) Definitions

Reserved

12-3.32A(3) Submittals

If requested, submit a certificate of compliance for each PCMS.

Submit your cell phone number before starting the first activity that requires a PCMS.

12-3.32A(4) Quality Assurance

Reserved

12-3.32B Materials

Each PCMS must have a message board, controller unit, power supply, and a structural support system. The unit must be assembled to form a complete self-contained PCMS that can be delivered to the job site and placed into immediate operation. The sign unit must be capable of operating at an ambient air temperature from -4 to 158 degrees F and must be unaffected by mobile radio transmissions other than those required to control the PCMS.

A PCMS must be permanently mounted on a trailer, truck bed, or truck cab under the manufacturer's instructions. The PCMS must be securely mounted on the support vehicle such that it remains attached during any impact to the vehicle. If it is mounted on a trailer, the trailer must be capable of being leveled and plumbed.

A minimum of 3 feet of retroreflective material must be permanently affixed on all 4 sides of the trailer. The retroreflective material need not be continuous but must be visible on the same plane.

The sign panel must be capable of displaying a 3-line message with at least 7 characters per line. The characters must be at least 18 inches in height where the useable shoulder area is at least 15 feet wide. To prevent encroachment onto the traveled way where the useable shoulder area is less than 15 feet wide, you may use a smaller message panel with at least 12-inch-high characters.

The message displayed on the sign must be visible from a distance of 1,500 feet and legible from a distance of 750 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20.

The characters on a sign panel may be 10 inches in height if:

1. PCMS is mounted on a service patrol truck or other incident response vehicle or used for traffic control operations on a highway facility where the posted speed limit is less than 40 mph
2. Message is legible from a distance of at least 650 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20

A matrix sign must provide a complete alphanumeric selection.

A PCMS must automatically adjust its brightness under varying light conditions to maintain the legibility of the message. The sign must be equipped with an automatic-dimming mode that automatically compensates for the influence of temporary light sources or abnormal lighting conditions. The sign must have 3 or more manual dimming modes of different intensities.

During the hours of darkness, a matrix sign not using lamps must be either internally or externally illuminated.

The controller must be an all solid-state unit containing the necessary circuitry for the storage of at least 5 preprogrammed messages. The controller must be installed at a location that allows the operator to perform all functions from a single position. The controller must have a keyboard entry system that allows the operator to generate an infinite number of additional messages in addition to the preprogrammed

stored messages. The keyboard must be equipped with a security lockout feature to prevent unauthorized use of the controller.

The controller must have:

1. Nonvolatile memory that stores keyboard-created messages during periods when the power is not activated
2. Variable display rate that allows the operator to match the information display to the speed of approaching traffic
3. Screen upon which messages may be reviewed before being displayed on the sign

The flashing-off time must be adjustable from within the control cabinet.

12-3.32C Construction

Place a PCMS as far from the traveled way as practicable where it is legible to approaching traffic without encroaching on the traveled way. Where the vertical roadway curvature restricts the sight distance of approaching traffic, place the sign on or before the crest of the curvature where it is most visible to the approaching traffic. Where the horizontal roadway curvature restricts the sight distance of approaching traffic, place the sign at or before the curve where it is most visible to approaching traffic. Where practicable, place the sign behind guardrail or Type K temporary railing.

Make a taper consisting of 9 traffic cones placed 25 feet apart to delineate the location of a PCMS except where the sign is placed behind guardrail or Type K temporary railing.

When in full operation, the bottom of a sign must be at least 7 feet above the roadway in areas where pedestrians are anticipated and 5 feet above the roadway elsewhere, and the top of the sign must be not more than 14.5 feet above the roadway.

Operate the PCMS under the manufacturer's instructions.

Keep the PCMS clean to provide maximum visibility.

If multiple signs are needed, place each sign on the same side of the road at least 1,000 feet apart on freeways and expressways and at least 500 feet apart on other types of highways.

If more than one PCMS is simultaneously visible to traffic, only 1 sign may display a sequential message at any time. Do not use dynamic message displays, such as animation, rapid flashing, dissolving, exploding, scrolling, horizontal movement, or vertical movement of messages. The message must be centered within each line of the display.

You may use an additional PCMS if more than 2 phases are needed to display a message.

Display only messages shown or ordered.

Repeat the entire message continuously in not more than 2 phases of at least 3 seconds per phase. The sum of the display times for both of the phases must be a maximum of 8 seconds. If more than 2 phases are needed to display a message, use an additional PCMS.

You must be available by cell phone during activities that require a sign. Be prepared to immediately change the displayed message if ordered. You may operate the sign with a 24-hour timer control or remote control if authorized.

After the initial placement, move a sign from location to location as ordered.

When a PCMS is not in use, move it to an area at least 15 feet from the edge of the traveled way or remove it from the job site away from traffic.

12-3.32D Payment

Not Used

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

DIVISION III EARTHWORK AND LANDSCAPE
20 LANDSCAPE

07-15-16

Replace 86 in the 1st paragraph of section 20-2.01C(2) with:

87

04-15-16

Replace the 8th paragraph of section 20-2.01C(2) with:

07-15-16

Trenches for irrigation supply lines and conduits 3 inches and larger in diameter must be a minimum of 18 inches below the finished grade, measured to the top of the installed pipe.

Replace 86 in the 1st paragraph of section 20-2.01C(3) with:

87

04-15-16

Replace section 20-2.04A(4) with:

04-15-16

Perform conductors test. The test must comply with the specifications in section 87.

Where the conductors are installed by trenching and backfilling, perform the test after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

Replace the 1st paragraph of section 20-2.04C(4) with:

04-15-16

Splice low voltage control and neutral conductors under section 87, except do not use Method B.

Replace the 3rd paragraph of section 20-2.05B with:

07-15-16

The impeller must be glass reinforced nylon on a tungsten carbide shaft.

Replace 86 in the 2nd paragraph of section 20-2.06C with:

87

04-15-16

Replace section 20-2.07B(5) with:

04-15-16

20-2.07B(5) PVC Pipe Conduit Sleeve

PVC pipe conduit sleeves must be schedule 40 complying with ASTM D1785.

Fittings must be schedule 80.

Replace section 20-2.07C(3) with:

04-15-16

20-2.07C(3) PVC Pipe Conduit Sleeve

Where PVC pipe conduit sleeves 2 inches or less in outside diameter is installed under surfacing, you may install by directional boring under section 20-2.07C(2)(b).

For sleeves 2 inches or less in diameter, the top of the conduit must be a minimum of 18 inches below surfacing.

Extend sleeves 6 inches beyond surfacing. Cap ends of conduit until used.

Replace sections 20-2.09B and 20-2.09C with:

07-15-16

20-2.09B Materials

20-2.09B(1) General

Swing joints must match the inlet connection size of the riser.

Where shown, a sprinkler assembly must include a check valve.

Threaded nipples for swing joints and risers must be schedule 80, PVC 1120 or PVC 1220 pipe, and comply with ASTM D1785. Risers for sprinkler assemblies must be UV resistant.

Fittings for sprinkler assemblies must be injection-molded PVC, schedule 40, and comply with ASTM D2466.

Flexible hose for sprinkler assemblies must be leak-free, non-rigid and comply with ASTM D2287, cell Type 6564500. The hose must comply with ASTM D2122 and have the thickness shown in the following table:

| Nominal hose diameter (inch) | Minimum wall thickness (inch) |
|---------------------------------|----------------------------------|
| 1/2 | 0.127 |
| 3/4 | 0.154 |
| 1 | 0.179 |

Solvent cement and fittings for flexible hose must comply with section 20-2.08B(5).

20-2.09B(2) Pop-Up Sprinkler Assemblies

Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure reducing device, fittings, and sprinkler protector where shown.

20-2.09B(3) Riser Sprinkler Assemblies

Each riser sprinkler assembly must include a body, flexible hose, threaded nipple, nozzle, swing joint (except for a Type V riser), pressure reducing device, fittings, and riser support where shown.

20-2.09B(4) Tree Well Sprinkler Assemblies

Each tree well sprinkler assembly must include a threaded nipple, nozzle, swing joint, fittings, perforated drainpipe, and drain grate.

The perforated drainpipe must be commercial-grade, rigid PVC pipe with holes spaced not more than 6 inches on center on 1 side of the pipe.

The drain grate must be a commercially-available, 1-piece, injection-molded grate manufactured from structural foam polyolefins with UV light inhibitors. Drain grate must be black.

Gravel for filling the drainpipe must be graded such that 100 percent passes the 3/4-inch sieve and 100 percent is retained on the 1/2-inch sieve. The gravel must be clean, washed, dry, and free from clay or organic material.

20-2.09C Construction

Where shown, install a flow shut-off device under the manufacturer's instructions, unless you use equipment with a preinstalled flow shut-off device.

Where shown, install a pressure reducing device under the manufacturer's instructions, unless you use equipment with a preinstalled pressure reducing device.

Install pop-up and riser sprinkler assembly:

- 1. From 6-1/2 to 8 feet from curbs, dikes, and sidewalks
- 2. At least 10 feet from paved shoulders
- 3. At least 3 feet from fences and walls

If sprinkler assembly cannot be installed within these limits, the location will be determined by the Engineer.

Set sprinkler assembly riser on slopes perpendicular to the plane of the slope.

Replace the paragraph of section 20-2.10B(3) with:

07-15-16

Each check valve must be one of the following:

- 1. Schedule 80 PVC with a factory setting to withstand a minimum 7-foot head on risers
- 2. Class 200 PVC if used on a nonpressurized plastic irrigation supply line
- 3. Internal to the sprinkler body with a factory setting to withstand a minimum 7-foot head

Replace the paragraph of section 20-2.10C(3) with:

07-15-16

Install check valves as necessary to prevent low-head drainage.

Replace the paragraphs of section 20-3.01B(10) with:

07-15-16

Each plant stake for vines must be nominal 1 by 1 inch and 18 inches long.

Each plant stake for trees must be nominal 2 by 2 inches or nominal 2 inches in diameter and long enough to keep the tree in an upright position.

Replace the paragraph of section 20-3.01B(11) with:

07-15-16

Each plant tie for vines must be extruded vinyl-based tape, 1 inch wide and at least 8 mils thick.

Each plant tie for trees must be a (1) minimum 3/4-inch-wide, UV-resistant, flexible vinyl tie complying with ASTM D412 for tensile and elongation strength, or (2) lock-stitch, woven polypropylene with a minimum 900 lb tensile strength.

Add between the 7th and 8th paragraphs of section 20-3.02C(3)(b):

07-15-16

Spread the vine shoots and tie them with a plant tie to each stake above the crossing point.

Replace the 8th paragraph of section 20-3.02C(3)(b) with:

07-15-16

Tie trees to the stakes with 2 tree ties, 1 tie to each stake. Each tie must form a figure eight by crossing the tie between the tree and the stake. Install ties at the lowest position that will support the tree in an upright position. Install the ties such that they provide trunk flexibility but do not allow the trunk to rub against the stakes. Wrap each end of the tie 1-1/2 turns around the stake and securely tie or nail it to the stake.

Replace the 1st paragraph of section 20-5.02C(1) with:

07-15-16

Where edging is used to delineate the limits of inert ground cover or wood mulch areas, install the edging before installing the inert ground cover or wood mulch.

Delete *AND MULCHES* in the heading of section 20-5.03.

07-15-16

Delete *and mulches* in the paragraph of section 20-5.03A(1)(a).

07-15-16

Replace the paragraph of section 20-5.03A(3)(a) with:

07-15-16

Before installing inert ground cover, remove plants and weeds to the ground level.

Delete *or mulch* at each occurrence in sections 20-5.03A(3)(c) and 20-5.03A(3)(d).

07-15-16

Replace section 20-5.03E with:

07-15-16

20-5.03E Reserved

Replace section 20-5.04 with:

07-15-16

20-5.04 WOOD MULCH

20-5.04A General

20-5.04A(1) Summary

Section 20-5.04 includes specifications for placing wood mulch.

20-5.04A(2) Definitions

Reserved

20-5.04A(3) Submittals

Submit a certificate of compliance for wood mulch.

Submit a 2 cu ft mulch sample with the mulch source shown on the bag. Obtain authorization before delivering the mulch to the job site.

20-5.04A(4) Quality Assurance

Reserved

20-5.04B Materials

20-5.04B(1) General

Mulch must not contain more than 0.1 percent of deleterious materials such as rocks, glass, plastics, metals, clods, weeds, weed seeds, coarse objects, sticks larger than the specified particle size, salts, paint, petroleum products, pesticides or chemical residues harmful to plant or animal life.

20-5.04B(2) Tree Bark Mulch

Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.

The mulch must be ground such that at least 95 percent of the material by volume is less than 2 inches long in any dimension and no more than 30 percent by volume is less than 1 inch long in any dimension.

20-5.04B(3) Wood Chip Mulch

Wood chip mulch must:

1. Be derived from clean wood
2. Not contain leaves or small twigs
3. Contain at least 95 percent by volume of wood chips with a width and thickness from 1/16 to 3/8 inch and a length from 1/2 to 3 inches

20-5.04B(4) Shredded Bark Mulch

Shredded bark mulch must:

1. Be derived from trees
2. Be a blend of loose, long, thin wood, or bark pieces
3. Contain at least 95 percent by volume of wood strands with a width and thickness from 1/8 to 1-1/2 inches and a length from 2 to 8 inches

20-5.04B(5) Tree Trimming Mulch

Tree trimming mulch must:

1. Be derived from chipped trees and may contain leaves and small twigs
2. Contain at least 95 percent by volume of material less than 3 inches long for any dimension and not more than 30 percent by volume of material less than 1 inch long for any dimension

20-5.04B(6)–20-5.04B(11) Reserved

20-5.04C Construction

Before placing wood mulch, remove plants and weeds to the ground level.

Maintain the planned flow lines, slope gradients, and contours of the job site. Grade the subgrade to a smooth and uniform surface.

Place mulch after the plants have been planted.

Place mulch in the plant basin at the rate described. Mulch must not come in contact with the plant crown and stem.

Place mulch as shown in areas outside of plant basins to a uniform thickness.

23-1.01D(1)(b) Test Result Disputes

You and the Engineer must work together to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 business days of receiving the test result if you dispute the test result.

If you or the Engineer dispute each other’s test results, submit your test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the independent third party participates in a dispute resolution, it must be qualified under AASHTO Materials Reference Laboratory program and the Department’s Independent Assurance Program. The independent third party must have no prior direct involvement with this Contract. By mutual agreement, the independent third party is chosen from:

1. Department laboratory in a district or region not in the district or region the project is located
2. Transportation Laboratory
3. Laboratory not currently employed by you or your material producer

If split acceptance samples are not available, the independent third party uses any available material representing the disputed material for evaluation.

If the independent third party determines the Department’s test results are valid, the Engineer deducts the independent third party testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party testing costs.

23-1.01D(2) Quality Control

23-1.01D(2)(a) General

Provide a QC manager when the quantity of subbase or base is as shown in the following table:

| QC Manager Requirements | |
|------------------------------------------|-------------|
| Subbase or base | Requirement |
| Stabilized soil (sq yd) | ≥ 20,000 |
| Aggregate subbases (cu yd) | ≥ 20,000 |
| Aggregate bases (cu yd) | ≥ 20,000 |
| CTB (cu yd) | ≥ 10,000 |
| Lean concrete base (cu yd) | ≥ 2,000 |
| Rapid strength concrete base (cu yd) | ≥ 1,000 |
| Lean concrete base rapid setting (cu yd) | ≥ 1,000 |
| Concrete base (cu yd) | ≥ 1,000 |
| Treated permeable bases (cu yd) | ≥ 2,000 |
| Reclaimed pavements (sq yd) | ≥ 10,000 |

Provide a testing laboratory to perform quality control tests. Maintain sampling and testing equipment in proper working condition.

You are not entitled to compensation for the suspension of work resulting from noncompliance with quality control requirements, including those identified within the QC plan.

23-1.01D(2)(b) Quality Control Plan

The QC plan must describe the organization and procedures used to:

1. Control the production process
2. Determine if a change to the production process is needed
3. Implement a change

The QC plan must include action and suspension limits and details of corrective action to be taken if any process is outside of those limits. Suspension limits must not exceed specified acceptance criteria.

24-1.01D(2)(d) Preparing Basement Material

After preparing an area for soil stabilization, verify the surface grades.

24-1.01D(2)(e) Mixing

Except for clods larger than 1 inch, randomly test the adequacy of the mixing with a phenolphthalein pH indicator solution.

Replace the 1st paragraph of section 24-1.03C with:

07-15-16

The Engineer orders the application rate as pounds of stabilizing agent per square yard of basement material to be stabilized.

Delete section 24-2.01D(1)(c)

07-15-16

Replace 250 in the 2nd sentence in the 2nd paragraph of section 24-2.01D(2)(c) with:

07-15-16

500

Add to section 24-2.01D(2):

07-15-16

24-2.01D(2)(d) Quality Control Testing

Lime stabilized soil quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

| Quality characteristic | Test method | Sampling location | Minimum frequency |
|----------------------------------------------------------------------------------------------------------|--------------------------|---------------------------|------------------------------------------------------------------------------------------------|
| Ground surface temperature before adding lime and full depth ground temperature during mixing operations | -- | Each temperature location | 1 test per 20,000 sq ft, minimum 1 per day |
| Lime application rate | Calibrated tray or equal | Roadway | 1 test per 40,000 sq ft, minimum 2 per day |
| Gradation on mixed material | California Test 202 | Roadway | 1 per 500 cu yd, minimum 1 per day |
| Moisture content | California Test 226 | Roadway | 1 per 500 cu yd on each layer, each day during mixing and mellowing periods, minimum 1 per day |
| Relative compaction | California Test 231 | Roadway | 1 per 500 cu yd on each layer, minimum 1 per day |

25 AGGREGATE SUBBASES

07-15-16

Replace *Reserved* in section 25-1.01C with:

07-15-16

Submit an aggregate subbase QC plan.

Replace *Reserved* in section 25-1.01D(2) with:

07-15-16

25-1.01D(2)(a) General

Reserved

25-1.01D(2)(b) Quality Control Plan

Reserved

25-1.01D(2)(c) Qualifications

Reserved

25-1.01D(2)(d) Quality Control Testing

AS quality control must include testing the quality characteristics at the frequencies shown in the following table:

| QC Testing Frequencies | | | |
|-------------------------------|---------------------|---------------------------------------------------------|---------------------------------------------------------------------------|
| Quality characteristic | Test method | Sampling location | Minimum frequency |
| R-value | California Test 301 | Stockpiles, transportation units, windrows, or roadways | 1 test before beginning work and every 2000 cu yd thereafter ^a |
| Aggregate gradation | California Test 202 | Stockpiles, transportation units, windrows, or roadways | 1 per 500 cu yd but at least one per day of placement |
| Sand equivalent | California Test 217 | Stockpiles, transportation units, windrows, or roadways | |
| Relative compaction | California Test 231 | Roadway | 1 per 500 sq yd on each layer |

^aAdditional R-value frequency testing will not be required when the average of 4 consecutive sand equivalent tests is 4 or more above the specified operating range value.

Add between the 2nd and 3rd paragraphs of section 25-1.01D(3):

07-15-16

The Engineer takes aggregate subbase samples for R-value, aggregate gradation, and sand equivalent from any of the following locations:

1. Windrow
2. Roadway

Replace the headings and paragraphs in section 27-1.01D with:

07-15-16

27-1.01D Quality Assurance

27-1.01D(1) General

After the CTB has been spread on the subgrade and before initial compaction, the cement content of the completed mixture of CTB must not vary from the specified cement content by more than 0.6 percent of the weight of the dry aggregate when tested under California Test 338.

For Class A CTB, compaction is tested under California Test 312 or 231.

The relative compaction of CTB must be at least 95 percent. Each layer of CTB may be tested for compaction, or all layers may be tested together at the option the Engineer. If all layers are tested together, you are not relieved of the responsibility to achieve the required compaction in each layer placed.

27-1.01D(1)(a) Aggregate

When tested under California Test 301, aggregate for Class B CTB must have (1) an R-value of at least 60 before mixing with cement and (2) an R-value of at least 80 when aggregate is mixed with an amount of cement that does not exceed 2.5 percent by weight of the dry aggregate.

Before sand equivalent testing, aggregate samples must not be treated with lime, cement, or chemicals.

If the aggregate gradation test results, the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing CTB for the remainder of the work day. Do not place additional CTB until you demonstrate to the Engineer that the CTB to be placed complies with the operating range requirements.

If the aggregate gradation test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the CTB or request a payment deduction. If your request is authorized, \$2.50/cu yd is deducted. If CTB is paid for by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant CTB left in place. An aggregate gradation and a sand equivalent test represents up to (1) 500 cu yd or (2) 1 day's production if less than 500 cu yd.

27-1.01D(1)(b) Road-Mixed Cement Treated Base Moisture Content

Just before initial compaction the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content is determined under California Test 312.

27-1.01D(1)(c) Plant-Mixed Cement Treated Base Moisture Content

At the point of delivery to the work, the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content under California Test 312.

27-1.01D(2) Quality Control

27-1.01D(2)(a) General

Reserved

27-1.01D(2)(b) Quality Control Plan

Reserved

27-1.01D(2)(c) Qualifications

Reserved

27-1.01D(2)(d) Quality Control Testing

CTB quality control must include testing the quality characteristics at the frequencies shown in the following table:

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Project No. 3605
March 5, 2019

County of El Dorado
Revised Standard Specifications
AA-23

QC Testing Frequencies

| Quality characteristic | Test method | Sampling location | Minimum frequency |
|-----------------------------------|------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
| Aggregate gradation | California Test 202 modified | Stockpiles, plant, transportation units, windrow, or roadway | 1 per 500 cu yd but at least one per day of placement |
| Sand equivalent | California Test 217 | Stockpiles, plant, transportation units, windrow, or roadway | |
| R-value ^a | California Test 301 | Stockpiles, plant, transportation units, windrows, or roadway | 1 test before starting work and every 2000 cu yd thereafter ^b |
| Optimum moisture content | California Test 312 | Plant, transportation units, windrow, or roadway | 1 per day of placement |
| Moisture content | California Test 226 | Roadway | 1 per 500 cu yd but at least one per day of placement |
| Cement content | California Test 338 | Windrows or roadway | 1 per 1000 cu yd but at least one per day of placement |
| Relative compaction | California Test 312 or 231 | Roadway | 1 per 2000 sq yd but at least one per day of placement |
| Compressive strength ^c | California Test 312 | Windrow or roadways | 1 per day of placement |

^aR-value is required for Class B CTB only

^bAdditional R-value frequency testing will not be required while the average of 4 consecutive sand equivalent tests is 4 or more above the specified operating range value.

^cCompressive strength is required for Class A CTB only when specified

27-1.01D(3) Department Acceptance

The Department's acceptance testing includes testing the CTB quality characteristics shown in the following table:

CTB Requirements for Acceptance

| Quality characteristic | Test method |
|-----------------------------------|------------------------------|
| Aggregate gradation | California Test 202 modified |
| Sand equivalent | California Test 217 |
| R-value ^a | California Test 301 |
| Optimum moisture content | California Test 312 |
| Moisture content | California Test 226 |
| Cement content | California Test 338 |
| Relative compaction | California Test 312 or 231 |
| Compressive strength ^b | California Test 312 |

^aR-value is required for Class B CTB only

^bCompressive strength is required for Class A CTB only when specified

The Engineer takes samples for aggregate gradation and sand equivalent from any of the following locations:

1. Plant
2. Truck
3. Windrow, for road-mixed only

Add to section 28-2.01C(1):

07-15-16

Submit a lean concrete base QC plan.

Replace the headings and paragraphs in section 28-2.01D with:

07-15-16

28-2.01D Quality Assurance

28-2.01D(1) General

28-2.01D(1)(a) General

The molds for compressive strength testing under ASTM C31 or ASTM C192 must be 6 by 12 inches.

If the aggregate gradation test results, sand equivalent test results or both comply with the contract compliance requirements but not the operating range requirements, you may continue placing LCB for the remainder of the work day. Do not place additional LCB until you demonstrate the LCB to be placed complies with the operating range requirements.

28-2.01D(1)(b) Qualifications

Field qualification tests and calculations must be performed by an ACI certified "Concrete Laboratory Technician, Grade I.

28-2.01D(1)(c) Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. The qualification tests include (1) a sand equivalent and (2) an average 7-day compressive strength under ASTM C39 of 3 cylinders manufactured under ASTM C192 except cure cylinders in molds without lids after initial curing.

For the compressive strength test, the cement content for each cylinder must be 300 lb/cu yd. The 7-day average compressive strength must be at least 610 psi. The cement must be Type II portland cement.

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

28-2.01D(1)(d) Field Qualification Testing

Before placing LCB, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to the authorized mix designs.

Notify the Engineer at least 5 business days before field qualification. Perform the field qualification at the job site or an authorized location.

Field qualification testing includes tests for compressive strength, air content, and penetration or slump.

For compressive strength field qualification testing:

1. Prepare 12 cylinders under ASTM C31 except final cure cylinders in molds without lids from a single batch.
2. Perform 3 tests; each test consists of determining the average compressive strength of 2 cylinders at 7 days under ASTM C39. The average compressive strength for each test must be at least 530 psi

If you submitted a notice to produce LCB qualifying for a transverse contraction joint waiver, manufacture additional specimens and test the LCB for compressive strength at 3 days. Prepare the compressive strength cylinders under ASTM C31 except final cure cylinders in molds without lids at the same time using the same material and procedures as the 7-day compressive strength cylinders except do not submit 6 additional test cylinders. The average 3-day compressive strength for each test must be not more than 500 psi.

28-2.01D(2) Quality Control

28-2.01D(2)(a) General

Reserved

28-2.01D(2)(b) Quality Control Manager

Reserved

28-2.01D(2)(c) Quality Control Testing

Test the LCB under the test methods and at the locations and frequencies shown in the following table:

LCB Sampling Location and Testing Frequencies

| Quality characteristic | Test method | Sampling location | Minimum sampling and testing frequency |
|--------------------------|-----------------------|-------------------|------------------------------------------------------------|
| Sand equivalent | ASTM D2419 | Source | 1 per 500 cubic yards but at least 1 per day of production |
| Aggregate gradation | ASTM C136 | | |
| Air content | ASTM C231 | Job site | |
| Penetration ^a | ASTM C360 | | |
| Slump ^a | ASTM C143 | | |
| Compressive strength | ASTM C39 ^b | | |

^aTest for either penetration or slump

^bPrepare cylinders under ASTM C31 except final cure cylinders in molds without lids.

28-2.01D(3) Department Acceptance

The Department accepts LCB based on compliance with the requirements shown in the following table:

LCB Requirements for Acceptance

| Quality characteristic | Test method | Requirement |
|-------------------------------------------|-----------------------|------------------|
| Compressive strength (min, psi at 7 days) | ASTM C39 ^a | 530 ^b |

^aCylinders prepared under ASTM C31 except final cure cylinders in molds without lids.

^bA compressive strength test represents up to (1) 1,000 cu yd or (2) 1 day's production if less than 1,000 cu yd.

Replace section 28-2.01D(4) in item 3 of the 5th paragraph in section 28-2.03D with:

07-15-16

section 28-2.01D(1)(c)

Replace the 1st paragraph in section 28-2.03F with:

07-15-16

After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03I.

Apply curing compound:

1. In 2 separate applications
2. Before the atmospheric temperature falls below 40 degrees F
3. At a rate of 1 gal/150 sq ft for the first application
4. At a rate of 1 gal/200 sq ft for the second application

Replace *Reserved* in section 28-3.01C(3) with:

07-15-16

Submit a rapid strength concrete base QC plan.

Replace the headings and paragraphs in section 28-3.01D with:

07-15-16

28-3.01D Quality Assurance

28-3.01D(1) General

28-3.01D(1)(a) General

At the preconstruction meeting be prepared to discuss the project specifications and methods of performing each item of work. Items discussed must include the processes for:

1. Production
2. Transportation
3. Placement
4. QC plan, if specified in the special provisions
5. Contingency plan
6. QC sampling and testing
7. Acceptance criteria

Beams for modulus of rupture testing must be fabricated and tested under California Test 524. The beams may be fabricated using an internal vibrator under ASTM C31. For each test, 3 beam must be fabricated and the test results averaged. No single test represents more than that day's production or 130 cu yd, whichever is less.

For early age testing, beams must be cured so the monitored temperatures in the beams and the test strip are always within 5 degrees F. The internal temperatures of the RSC base and early age beams must be monitored and recorded at intervals of at least 5 minutes. Thermocouples or thermistors connected to strip-chart recorders or digital data loggers must be installed to monitor the temperatures. Temperature recording devices must be accurate to within ± 2 degrees F. Until early age testing is completed, internal temperatures must be measured at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge.

For other age testing, beams must be cured under California Test 524 except beams must be placed into sand at a time that is the earlier of either from 5 to 10 times the final set time, or 24 hours.

RSC base must have an opening age modulus of rupture of not less than 400 psi and a 7-day modulus of rupture of not less than 600 psi.

28-3.01D(1)(b) Preconstruction Meeting

Reserved

28-3.01D(1)(c) Test Strip

Reserved

28-3.01D(2) Quality Control

28-3.01D(2)(a) General

Reserved

28-3.01D(2)(b) Quality Control Manager

Reserved

28-3.01D(2)(c) Quality Control Testing

Test the rapid strength concrete base under the test methods and at the locations and frequencies shown in the following table:

Rapid Strength Concrete Base Sampling Location and Testing Frequencies

| Quality characteristic | Test method | Sample Location | Minimum testing frequency ^a |
|---------------------------------------------------|--------------------------------------------|-----------------|------------------------------------------------|
| Cleanness value | California Test 227 | Source | 1 per 500 cubic yards but at least 1 per shift |
| Sand equivalent | California Test 217 | | |
| Aggregate gradation | California Test 202 | | |
| Air content | California Test 504 | Job site | 1 per 130 cu yd but at least 1 per shift |
| Yield | California Test 518 | | 1 per shift |
| Slump or penetration | ASTM C143 or California Test 533 | | 1 per 2 hours of placement |
| Density | California Test 518 | | 1 per shift |
| Aggregate moisture meter calibration ^b | California Test 223 or California Test 226 | | 1 per shift |
| Modulus of rupture | California Test 524 | | 1 per 130 cu yd but at least 1 per shift |

^aTest at the most frequent interval.

^bCheck calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Notify the Engineer at least 2 business days before any sampling and testing. Submit testing results within 15 minutes of testing completion. Record inspection, sampling, and testing on the forms accepted with the QC plan and submit them within 48 hours of completion of each day of production and within 24 hours of 7-day modulus of rupture tests.

During the placement of RSC base, fabricate beams and test for the modulus of rupture:

1. At opening age
2. At 7 days after placing the first 30 cu yd
3. At least once every 130 cu yd
4. Within the final truckload

Opening age tests must be performed in the presence of the Engineer.

28-3.01D(3) Department Acceptance

The Department accepts RSC base based on compliance with the requirements shown in the following table:

RSC Base Requirements for Acceptance

| Quality characteristic | Test method | Requirement |
|-----------------------------------------|---------------------|-------------|
| Modulus of rupture (min, psi at 7 days) | California Test 524 | 600 |

The Engineer adjust payment for RSC base for the 7-day modulus of rupture as follows:

1. Payment for a base with a modulus of rupture of 600 psi or greater is not adjusted.
2. Payment for a base with a modulus of rupture of less than 600 and greater than or equal to 550 psi is reduced by 5 percent.
3. Payment for a base with a modulus of rupture of less than 550 and greater than or equal to 500 psi is reduced by 10 percent.
4. Payment for a base with a modulus of rupture of less than 500 psi is not adjusted and no payment is made. Remove and replace this base.

Add to section 28-4.01C(1):

07-15-16

Submit a lean concrete base rapid setting QC plan.

Replace the headings and paragraphs in section 28-4.01D with:

07-15-16

28-4.01D Quality Assurance

28-4.01D(1) General

28-4.01D(1)(a) General

For compressive strength testing, prepare 6 cylinders under California Test 540. Test cylinders must be 6 by 12 inches. As an alternative to rodding, a vibrator may be used under California Test 524. Test cylinders under California Test 521 and perform 3 tests with each test consisting of 2 cylinders. The test result is the average from the 2 cylinders.

28-4.01D(1)(b) Field Qualification

Before placing lean concrete base rapid setting, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to authorized mixed designs.

Proposed mix designs must be field qualified before you place the base represented by those mix designs. The technician performing the field test must hold current ACI certification as a Concrete Field Testing Technician-Grade I.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Lean Concrete Base Rapid Setting Requirements."

Field qualification must comply with the following:

1. Test for compressive strength at opening age and 7 days of age
2. At opening age, the compressive strength for each test must be at least 180 psi and the average strength for the 3 tests must be at least 200 psi
3. At 7 days age, the compressive strength for each test must be at least 600 psi and the average strength for the 3 tests must be at least 725 psi

28-4.01D(2) Quality Control

28-4.01D(2)(a) General

Reserved

28-4.01D(2)(b) Quality Control Manager

Reserved

28-4.01D(2)(c) Quality Control Testing

Test the base under the test methods and at the locations and frequencies shown in the following table:

LCB Rapid Setting Sampling Location and Testing Frequencies

| Quality characteristic | Test method | Sampling location | Minimum sampling and testing frequency |
|--------------------------|---------------------|-------------------|------------------------------------------------------------------------------|
| Sand equivalent | ASTM D2419 | Source | 1 per 500 cu yd, minimum 1 per day of production |
| Aggregate gradation | ASTM C136 | | |
| Air content | ASTM C231 | Job site | 1 per 4 hours of placement work, plus one in the last hour of placement work |
| Penetration ^a | ASTM C360 | | |
| Slump ^a | ASTM C143 | | |
| Compressive strength | California Test 521 | | |

^aTest either penetration or slump

During placement of lean concrete base rapid setting, fabricate cylinders and test compressive strength for opening age and 7 days. Opening age tests must be performed in the presence of the Engineer.

28-4.01D(3) Department Acceptance

The Department accepts LCB rapid setting based on compliance with the requirement shown in the following table:

LCB Rapid Setting Requirements for Acceptance

| Quality characteristic | Test method | Requirement |
|-------------------------------------------|----------------------------------|-------------|
| Compressive strength (min, psi at 7 days) | California Test 521 ^a | 725 |

^aCylinders made under California Test 540

Replace the 2nd and 3rd paragraphs in section 28-4.03A with:

07-15-16

Concrete paving operations with equipment not supported by the base may start before opening age. Do not open pavement for traffic before opening age of the LCB rapid setting.

Any other paving operations must start after the final set time of the base. The base must have a compressive strength of at least 450 psi under California Test 521 before:

1. Placing HMA
2. Placing other base material
3. Operating equipment on the base

Replace *Reserved* in section 28-5.01C with:

07-15-16

Submit a concrete base QC plan.

Replace the headings and paragraphs in section 28-5.01D(2) with:

07-15-16

28-5.01D(2) Quality Control

28-5.01D(2)(a) General

Reserved

28-5.01D(2)(b) Quality Control Manager

Reserved

28-5.01D(2)(c) Quality Control Testing

Test the concrete base under the test methods and at the locations and frequencies shown in the following table:

Concrete Base Sampling Location and Testing Frequencies

| Quality characteristic | Test method | Sample location | Minimum testing frequency ^a |
|---------------------------------------------------|--------------------------------------------|-----------------|------------------------------------------------|
| Cleanness value | California Test 227 | Source | 1 per 500 cubic yards but at least 1 per shift |
| Sand equivalent | California Test 217 | | |
| Aggregate gradation | California Test 202 | | |
| Air content | California Test 504 | Job site | 1 per 500 cu yd but at least 1 per shift |
| Yield | California Test 518 | | 1 per shift |
| Slump or penetration | ASTM C143 or California Test 533 | | 1 per 2 hours of placement |
| Density | California Test 518 | | 1 per shift |
| Aggregate moisture meter calibration ^b | California Test 223 or California Test 226 | | 1 per shift |
| Modulus of rupture | California Test 524 | | 1 per 500 cu yd but at least 1 per shift |

^aTest at the most frequent interval.

^bCheck calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

28-5.01D(3) Department Acceptance

The Department accepts a concrete base based on compliance with the requirements shown in the following table:

Concrete Base Requirements for Acceptance

| Quality characteristic | Test method | Requirement |
|------------------------------------------|---------------------|-------------|
| Modulus of rupture (min, psi at 28 days) | California Test 523 | 570 |

Acceptance for the modulus of rupture is on a lot basis. The Department provides the molds and machines for the modulus of rupture acceptance testing. Provide any material and labor the Engineer may require for the testing.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

29 TREATED PERMEABLE BASES

07-15-16

Replace the headings and paragraphs in section 29-1.01 with:

07-15-16

29-1.01 GENERAL

29-1.01A Summary

Section 29-1 includes general specifications for constructing treated permeable bases.

29-1.01B Definitions

Reserved

29-1.01C Submittals

Submit a treated permeable base quality control plan.

29-1.01D Quality Assurance

29-1.01D(1) General

Reserved

29-1.01D(2) Quality Control

29-1.01D(2)(a) General

Reserved

29-1.01D(2)(b) Quality Control Plan

Reserved

29-1.01D(2)(c) Qualifications

Reserved

29-1.01D(3) Department Acceptance

Reserved

Replace the headings and paragraphs in section 29-2.01D with:

07-15-16

29-2.01D Quality Assurance

29-2.01D(1) General

The Engineer determines the asphalt content of the asphalt mixture under California Test 382. The bitumen ratio, pounds of asphalt per 100 lb of dry aggregate, must not vary more than 0.5 lb of asphalt above or below the quantity designated by the Engineer. Samples used to determine the bitumen ratio are obtained from trucks at the plant or from the mat behind the paver before rolling. If the sample is taken from the mat behind the paver, the bitumen ratio must not be less than the quantity designated by the Engineer, less 0.7 lb of asphalt per 100 lb of dry aggregate.

29-2.01D(2) Quality Control

29-2.01D(2)(a) General

Reserved

29-2.01D(2)(b) Quality Control Testing

ATPB quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

| Quality characteristic | Test method | Sampling location | Minimum frequency |
|----------------------------------------|---------------------|---------------------------------------------------|-------------------------------------------------------------------------|
| Gradation | California Test 202 | Stockpiles or plant | 1 for every 4 hours of production but at least one per day of placement |
| Cleanness value | California Test 227 | Stockpiles or plant | 1 for every 4 hours of production but at least one per day |
| Percentage of crushed particles | California Test 205 | Stockpiles or plant | 1 test before production and one every 5,000 cu yd thereafter |
| Los Angeles rattler loss at 500 rev | California Test 211 | Stockpiles or plant | 1 test before production and one every 5,000 cu yd thereafter |
| Film stripping | California Test 302 | Plant | 1 test before production and one every 5000 cu yd thereafter |
| Asphalt content of the asphalt mixture | California Test 382 | Plant, transportation units, windrows, or roadway | 1 for every 4 hours of production but at least one per day |

29-2.01D(3) Department Acceptance

The Department accepts ATPB based on aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, film stripping and asphalt content requirements specified in section 29-2.02 and section 29-2.01D(1).

The Engineer takes samples for aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, and film stripping from the plant.

The Engineer takes samples for asphalt content of the asphalt mixture from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Roadbed

Replace the headings and paragraphs in section 29-3.01 with:

07-15-16

29-3.01 GENERAL

29-3.01A Summary

Section 29-3 includes specifications for constructing cement treated permeable bases.

29-3.01B Definitions

Reserved

29-3.01C Submittals

Reserved

29-3.01D Quality Assurance

29-3.01D(1) General

Reserved

Replace the table in section 30-3.02A with:

07-15-16

FDR—Foamed Asphalt Quality Characteristic Requirements

| Quality characteristic | Test method | Requirement |
|------------------------------------------------------------------------|---------------------|-------------------------|
| Moisture content before HMA paving | California Test 226 | < 50% of OMC |
| Asphalt binder expansion ratio (min, %) | Note a | 10 |
| Asphalt binder half-life (seconds, min) | | 12 |
| Gradation (% passing) Sieve Size: 3 inch 2 inch 1-1/2 inch | California Test 202 | 100 95-100 85-100 |
| Moisture content Maximum Minimum | California Test 226 | OMC OMC - 2% |
| In-place wet density (lb/cu ft) | California Test 216 | Report only |
| Relative compaction (min, %) | California Test 231 | 98 |
| Indirect dry tensile strength (psi) ^b | California Test 371 | 90% of mix design value |
| Indirect wet tensile strength (psi) ^b | California Test 371 | 90% of mix design value |
| Tensile strength ratio (%) | California Test 371 | 90% of mix design value |

^aTest at the foaming temperature and percentage of foaming water by dry weight of FDR—foamed asphalt material designated in the mix design. To test asphalt binder expansion ratio and half-life, use a pail of known volume and a dipstick calibrated for the pail. From the inspection nozzle on the asphalt binder spray bar, inject foamed asphalt into the pail without exceeding the pail's capacity. With the dipstick, immediately measure and record the level of foamed asphalt in the pail. Record the half-life in seconds from the time the injection of foamed asphalt in the pail is turned off to half the dip stick reading after peak. Calculate the expansion ratio as the volume of the foamed asphalt upon injection divided by the volume of the unfoamed asphalt binder.

^bFrom material passing the 1-inch sieve, compact 6 specimens under California Test 304, Part 2. Cure the specimens at 100 °F for 72 hours and allow the specimens to cool to room temperature. Test 3 specimens for dry tensile strength under California Test 371. Test 3 specimens for wet tensile strength under California Test 371 after moisture conditioning.

Replace section 30-4.01D(3) in the 2nd paragraph of section 30-4.01D(1) with:

07-15-16

section 30-4.01D(4)

Replace section 30-4.01D(1)(a) in the table in section 30-4.02A with:

07-15-16

section 30-4.01D(2)

DIVISION V SURFACINGS AND PAVEMENTS

37 BITUMINOUS SEALS

07-15-16

Replace section 37 with:

07-15-16

37 SEAL COATS

37-1 GENERAL

37-1.01 GENERAL

37-1.01A Summary

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

37-1.01B Definitions

Reserved

37-1.01C Submittals

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

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

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

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

37-1.01D Quality Assurance

37-1.01D(1) General

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

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

37-1.01D(2) Preconstruction Meeting

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

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

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

1. Quality control testing
2. Acceptance testing
3. Seal coat placement
4. Proposed application rates for asphaltic emulsion or asphalt binder and aggregate.
5. Training on placement methods
6. Checklist of items for proper placement

Greenstone Rd at Slate Creek Bridge Replacement
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County of El Dorado
Revised Standard Specifications
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7. Unique issues specific to the project, including:
 - 7.1. Weather
 - 7.2. Alignment and geometrics
 - 7.3. Traffic control requirements
 - 7.4. Haul distances
 - 7.5. Presence and absence of shaded areas
 - 7.6. Any other local conditions
8. Contingency plan for material deliveries, equipment breakdowns, and traffic handling
9. Who in the field has authority to adjust application rates and how adjustments will be documented
10. Schedule of sweepings

37-1.02 MATERIALS

Not Used

37-1.03 CONSTRUCTION

37-1.03A General

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

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

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

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

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

37-1.03B Equipment

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

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

- 4.1. Capable of producing a uniform application of asphaltic emulsion or asphalt binder in controlled quantities ranging from 0.02 to 1 gal/sq yd of surface and at a pressure ranging from 25 to 75 psi
- 4.2. Pumps that spray asphaltic emulsion or asphalt binder within 0.02 gal/sq yd of the set rate
- 4.3. With a hose and nozzle for application of asphaltic emulsion to areas inaccessible to the spray bar
- 4.4. With pressure gauges and a thermometer for determining temperatures of the asphaltic emulsion or asphalt binder

You may use cab-controlled valves for the application of asphaltic emulsion or asphalt binder. The valves controlling the flow from nozzles must act positively to provide a uniform unbroken application of asphaltic emulsion or asphalt binder.

Maintain distributor and storage tanks at all times to prevent dripping.

37-1.04 PAYMENT

Not Used

37-2 CHIP SEALS

37-2.01 GENERAL

37-2.01A General

37-2.01A(1) Summary

Section 37-2.01 includes general specifications for applying chip seals.

37-2.01A(2) Definitions

Reserved

37-2.01A(3) Submittals

At least 15 days before starting placement of chip seal, submit:

1. Samples for:
 - 1.1. Asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
 - 1.2. Polymer modified asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
 - 1.3. Asphalt rubber binder chip seal, two 1-quart cans of base asphalt binder
 - 1.4. Asphalt rubber binder chip seal, five 1-quart cans of asphalt rubber binder
2. Asphaltic emulsion, polymer modified asphaltic emulsion, asphalt binder or asphalt rubber binder data as follows:
 - 2.1. Supplier and Type/Grade of asphaltic emulsion or asphalt binder
 - 2.2. Type of modifier used including polymer or crumb rubber or both
 - 2.3. Percent of crumb rubber, if used as modifier
 - 2.4. Copy of the specified test results for asphaltic emulsion or asphalt binder
3. 50 lb of uncoated aggregate
4. Aggregate test results for the following:
 - 4.1. Gradation
 - 4.2. Los Angeles Rattler
 - 4.3. Percent of crushed particles
 - 4.4. Flat and elongated particles
 - 4.5. Film stripping
 - 4.6. Cleanness value
 - 4.7. Durability
5. Vialit test results

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

Quality Control Test Result Reporting

| Quality characteristic | Maximum reporting time allowance |
|--------------------------------------------------------|----------------------------------|
| Los Angeles Rattler loss (max, %) | 48 hours |
| Percent of crushed particles (min, %) | 48 hours |
| Flat and elongated particles (max by weight at 3:1, %) | 48 hours |
| Film stripping (max, %) | 48 hours |
| Durability (min) | 48 hours |
| Gradation (percentage passing) | 24 hours |
| Cleaness value (min) | 24 hours |
| Asphaltic emulsion spread rate (gal/sq yd) | 24 hours |

Within 3 days after taking asphaltic emulsion or asphalt binder quality control samples, submit the authorized laboratory's test results.

37-2.01A(4) Quality Assurance

37-2.01A(4)(a) General

Reserved

37-2.01A(4)(b) Quality Control

37-2.01A(4)(b)(i) General

Reserved

37-2.01A(4)(b)(ii) Aggregate

All tests must be performed on uncoated aggregate except for film stripping which must be performed on precoated aggregate.

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Aggregate Quality Control Requirements

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------|-------------------------|
| Los Angeles Rattler loss (max, %) At 100 revolutions At 500 revolutions | California Test 211 | 1st day of production | See California Test 125 |
| Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve) One fractured face | AASHTO T 335 | 1st day of production | See California Test 125 |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791 | 1st day of production | See California Test 125 |
| Film stripping (max, %) | California Test 302 | 1st day of production | See California Test 125 |
| Durability (min) | California Test 229 | 1st day of production | See California Test 125 |
| Gradation (% passing) | California Test 202 | 2 per day | See California Test 125 |
| Cleanness value (min) | California Test 227 | 2 per day | See California Test 125 |

37-2.01A(4)(b)(iii) Chip Seals

For a chip seal, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Chip Seal Quality Control Requirements

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|---------------------------------------------------|---------------------|----------------------------------------|----------------------|
| Asphaltic emulsion binder spread rate (gal/sq yd) | California Test 339 | 1 per day per distributor truck | Pavement surface |

37-2.01A(4)(c) Department Acceptance

Department Acceptance shall not apply to identified areas where the existing surfacing before application of chip seal, contains defective areas as determined by the Engineer and Contractor. At least 7 days before starting placement of the chip seal, the Contractor shall submit a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway post mile locations, and defect type. The Engineer must agree on which of the identified areas are defective.

Defective areas are defined as one of the following:

1. Areas with wheel path rutting in excess of 3/8 inch when measured by placing a straightedge 12 feet long on the finished surface perpendicular to the center line and measuring the vertical distance between the finished surface and the lower edge of the straightedge
2. Areas exhibiting flushing

For a chip seal, acceptance is based on visual inspection for the following:

1. Uniform surface texture

2. Raveling, which consists of the separation of the aggregate from the asphaltic emulsion or asphalt binder
3. Flushing, which consists of the occurrence of a film of asphaltic material on the surface of the chip seal.
4. Streaking, which consists of alternating longitudinal bands of asphaltic emulsion or asphalt binder without uniform aggregate retention, approximately parallel with the lane line.

Areas of raveling, flushing or streaking that are greater than 0.5 sq ft shall be considered defective and must be repaired.

Raveling and streaking must be repaired by placing an additional layer of chip seal over the defective area.

For asphaltic emulsion or asphalt binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

For aggregate, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Chip Seal Aggregate Acceptance Criteria

| Quality characteristic | Test method | Requirements |
|--------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------|
| Los Angeles Rattler loss (max, %) | | |
| At 100 revolutions | California Test 211 | 10 |
| At 500 revolutions | | 40 |
| Percent of crushed particles: | AASHTO T 335 | |
| Coarse aggregate (min, %) | | |
| One-fractured face | | 95 |
| Two-fractured faces | | 90 |
| Fine aggregate (min, %) | | |
| (Passing No. 4 sieve and retained on No. 8 sieve) | | |
| One fractured face | | 70 |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791 | 10 |
| Film stripping (max, %) | California Test 302 | 25 |
| Durability (min) | California Test 229 | 52 |
| Gradation (% passing by weight) | California Test 202 | Aggregate Gradation table shown under Materials for the chip seal type specified. |
| Cleanness value (min) | California Test 227 | 80 |

If test results for the aggregate gradation do not comply with specifications, you may remove the chip seal represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the aggregate represented by the test results.

If test results for aggregate cleanness value do not comply with the specifications, you may remove the chip seal represented by these tests or you may request that the chip seal remain in place with a pay deduction corresponding to the cleanness value shown in the following table:

Chip Seal Cleanness Value Deductions

| Cleanness value | Deduction |
|-----------------|-------------|
| 80 or over | None |
| 79 | \$2.00 /ton |
| 77-78 | \$4.00 /ton |
| 75-76 | \$6.00 /ton |

If the aggregate cleanness value is less than 75, remove the chip seal.

37-2.01B Materials

37-2.01B(1) General

Reserved

37-2.01B(2) Asphaltic Emulsions and Asphalt Binders

Reserved

37-2.01B(3) Aggregate

37-2.01B(3)(a) General

Aggregate must be broken stone, crushed gravel, or both.

Aggregate must comply with the requirements shown in the following table:

| Chip Seal Aggregate Requirements | | |
|--------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------|
| Quality characteristic | Test method | Requirements |
| Los Angeles Rattler loss (max, %) | | |
| At 100 revolutions | California Test 211 | 10 |
| At 500 revolutions | | 40 |
| Percent of crushed particles | AASHTO T 335 | |
| Coarse aggregate (min, %) | | |
| One-fractured face | | 95 |
| Two-fractured faces | | 90 |
| Fine aggregate (min, %) | | |
| (Passing No. 4 sieve and retained on No. 8 sieve) | | |
| One fractured face | | 70 |
| Flat and elongated particles (max by weight at 3:1, %) | ASTM D4791 | 10 |
| Film stripping (max, %) | California Test 302 | 25 |
| Durability (min) | California Test 229 | 52 |
| Gradation (% passing by weight) | California Test 202 | Aggregate Gradation table shown under Materials for the chip seal type specified. |
| Cleanness value (min) | California Test 227 | 80 |

The authorized laboratory must conduct the Vialit test using the proposed asphaltic emulsion or asphalt binder and aggregate for compliance with the requirements shown in the following table:

| Chip Retention Requirements | | |
|------------------------------------|-------------------------------------------------------------------------------------|-------------|
| Quality characteristic | Test method | Requirement |
| Chip retention (%) | Vialit test method for aggregate in chip seals, French chip (Modified) ^a | 95 |

^aThe asphaltic emulsion or asphalt binder must be within the field placement temperature range and application rate during specimen preparation. For asphalt binder cure the specimen for first 2 hours at 100 °F.

37-2.01B(3)(b) Precoated Aggregate

Precoating of aggregate must be performed at a central mixing plant. The plant must be authorized under the Department's *MPQP*.

When precoating aggregate, do not recombine fine materials collected in dust control systems.

Precoated aggregate must be preheated from 260 to 325 degrees F. Coat with any of the asphalts specified in the table titled "Performance Graded Asphalt Binder" in section 92. The asphalt must be from 0.5 to 1.0 percent by weight of dry aggregate. You determine the exact asphalt rate for precoating of aggregate.

Do not stockpile precoated aggregate.

37-2.01C Construction

37-2.01C(1) General

For chip seals on 2-lane, 2-way roadways, place a W8-7 (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along each side of the traveled way where aggregate is spread on a traffic lane and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign in each direction where traffic first encounters the loose aggregate, regardless of which lane the aggregate is spread on. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

For chip seals on freeways, expressways, and multilane conventional highways, place a W8-7, (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along the outside edge of the traveled way nearest to the lane worked on, at on ramps, and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign where the aggregate starts with respect to the direction of travel on that lane. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

Pilot cars must have cellular or radio contact with other pilot cars and personnel in the work zone. The maximum speed of the pilot cars conveying or controlling traffic through the traffic control zone must be 15 mph on 2-lane, two-way highways and 25 mph on multilane divided and undivided highways. Pilot cars must only use traffic lanes open to traffic.

On the days that closures are not allowed, you may use a moving closure to maintain the seal coat surface. The moving closure is only allowed during daylight hours when traffic will be the least inconvenienced and delayed. The Engineer determines the hours for the moving closure.

Maintain signs in place at each location until the final sweeping of the chip seal surface for that location is complete. Signs may be set on temporary portable supports with the W13-1 sign below the W8-7 sign or on barricades with the W13-1 sign alternating with the W8-7 sign.

Schedule chip seal activities so that the chip seals are placed on both lanes of the traveled way each work shift.

If traffic is routed over a surface where a chip seal application is intended, the chip seal must not be applied to more than half the width of the traveled way at a time, and the remaining width must be kept free of obstructions and open to traffic until the previously applied width is ready for traffic use.

Wherever maintenance sweeping of the chip seal surface is complete, place permanent traffic stripes and pavement markings within 10 days.

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the chip seal work completed that has not received permanent traffic stripes and pavement markings.

37-2.01C(2) Equipment

Equipment for chip seals must include and comply with the following:

1. Aggregate haul trucks must have:
 - 1.1. Tailgate that discharge aggregate
 - 1.2. Device to lock onto the rear aggregate spreader hitch
 - 1.3. Dump bed that will not push down on the spreader when fully raised
 - 1.4. Dump bed that will not spill aggregate on the roadway when transferred to the spreader hopper

- 1.5. Tarpaulin to cover precoated aggregate when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
2. Self-propelled aggregate spreaders must have:
 - 2.1. Aggregate hopper in the rear
 - 2.2. Belt conveyor that carries the aggregate to the front
 - 2.3. Spreading hopper capable of providing a uniform aggregate spread rate over the entire width of the traffic lane in 1 application.
3. Self-propelled power brooms must:
 - 3.1. Not be steel-tined brooms on emulsion chip seals
 - 3.2. Be capable of removing loose aggregate adjacent to barriers that prevent aggregate from being swept off the roadway, including curbs, gutters, dikes, berms, and railings
4. Pneumatic or foam filled rubber tired rollers must:
 - 4.1. Be an oscillating type at least 4 feet wide
 - 4.2. Be self-propelled and reversible
 - 4.3. Have tires of equal size, diameter, type, and ply
 - 4.4. Carry at least 3,000 lbs of load on each wheel
 - 4.5. Have tires with an air pressure of 100 ± 5 psi or be foam filled

37-2.01C(3) Surface Preparation

Before applying chip seals, cover manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after the application of the chip seal.

Immediately before applying chip seals, clean the surface to receive a chip seal by removing any extraneous material affecting adhesion of the chip seal with the existing surface and drying. Use self-propelled power brooms to clean the existing pavement.

37-2.01C(4) Placement

37-2.01C(4)(a) General

Schedule the operations so that chip seals are placed on both lanes of the traveled way each work shift. At the end of the work shift, the end of the chip seals on both lanes must generally match.

37-2.01C(4)(b) Applying Asphaltic Emulsions or Asphalt Binders

Prevent spraying on existing pavement not intended for chip seals or on previously applied chip seals using a material such as building paper. Remove the material after use.

Align longitudinal joints between chip seal applications with designated traffic lanes.

For asphaltic emulsion or asphalt binder, overlap longitudinal joints by not more than 4 inches. You may overlap longitudinal joints up to 8 inches if authorized.

For areas not accessible to a truck distributor bar apply:

1. Asphaltic emulsions by hand spraying
2. Asphalt binders with a squeegee or other authorized means

You may overlap the asphaltic emulsion or asphalt binder applications before the application of aggregate at longitudinal joints.

Do not apply the asphaltic emulsion or asphalt binder unless there is sufficient aggregate at the job site to cover the asphaltic emulsion or asphalt binder.

Discontinue application of asphaltic emulsion or asphalt binder early enough to comply with lane closure requirements. Apply to 1 lane at a time and cover the lane width entirely in 1 operation.

37-2.01C(4)(c) Spreading Aggregates

37-2.01C(4)(c)(i) General

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading aggregate.

Spread aggregate within 10 percent of your determined rate.

Spread aggregate at a uniform rate over the full lane width in 1 application. Apply to 1 lane at a time.

Sweep excess aggregate at joints before spreading adjacent aggregate.

Operate the spreader at speeds slow enough to prevent aggregate from rolling over after dropping.

If the spreader is not moving, aggregate must not drop. If you stop spreading and aggregate drops, remove the excess aggregate before resuming activities.

37-2.01C(4)(c)(ii) Precoated Aggregate Application

During transit, cover precoated aggregate with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

When applied, precoated aggregate must be from 225 to 325 degrees F.

37-2.01C(4)(d) Finishing

37-2.01C(4)(d)(i) General

Remove piles, ridges, or unevenly distributed aggregate. Repair permanent ridges, bumps, streaks or depressions in the finished surface. Spread additional aggregate and roll if aggregate is picked up by rollers or vehicles.

Chip seal joints between adjacent applications of a chip seal must be smooth, straight, uniform, and completely covered.

A coverage is 1 roller movement over the entire width of lane. A pass is 1 roller movement parallel to the chip seal application in either direction. Overlapping passes are part of the coverage being made and are not part of a subsequent coverage. Do not start a new coverage until completing the previous coverage.

Before opening to traffic, finish the chip seals in the following sequence:

1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
2. Perform final rolling consisting of 2 coverages with a pneumatic-tired roller
3. Sweep excess aggregate from the roadway and adjacent abutting areas
4. Apply a flush coat if specified
5. Remove covers from the facilities

37-2.01C(4)(d)(ii) Traffic Control With Pilot Car

For 2-lane 2-way roadways under 1-way traffic control, upon completion of final rolling, traffic must be controlled with pilot cars and routed over the new chip seal for a period of 2 to 4 hours before opening the lane to traffic not controlled with pilot cars.

For multilane roadways, when traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to traffic. Traffic must be controlled with pilot cars and be routed on the new chip seal surface of the lane for a minimum of 2 hours after completion of the initial sweeping and before opening the lane to traffic not controlled with pilot cars. Once traffic controlled with pilot cars is routed over the chip seal at a particular location, continuous control must be maintained at that location until the chip seal placement and sweeping on adjacent lanes to receive a chip seal is completed.

37-2.01C(4)(d)(iii) Sweeping

Sweeping must be performed after the chip seal has set and there is no damage or dislodging of aggregate from the chip seal surface. As a minimum, sweeping is required at the following times:

1. On 2-lane 2-way roadways, from 2 to 4 hours after traffic, controlled with pilot cars, has been routed on the chip seal
2. On multilane roadways, from 2 to 4 hours after aggregate have been placed
3. In addition to previous sweeping, perform final sweeping immediately before opening any lane to public traffic, not controlled with pilot cars

37-2.01C(4)(d)(iv) Excess Aggregate

Dispose of excess aggregate. If ordered, salvaging and stockpiling of excess aggregate is change order work.

37-2.01C(4)(e) Chip Seal Maintenance

Perform sweeping on the morning following the application of aggregate on any lane that has been open to traffic not controlled with pilot cars and before starting any other activities.

Chip seal surfaces must be maintained for 4 consecutive days from the day aggregate is applied. Maintenance must include sweeping to maintain a surface free of loose aggregate and to prevent formation of corrugations. Sweeping must not dislodge aggregate set in asphaltic emulsion or asphalt binder.

After 4 consecutive days, excess aggregate must be removed from the paved areas.

37-2.01D Payment

If there is no bid item for traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the chip seal.

The payment quantity for precoated aggregate is the weight measured after the aggregate is preheated and precoated with asphalt binder.

If recorded batch weights are printed automatically, the payment quantity for aggregate is the weight determined from the printed batch weights if:

1. Total weight for the precoated aggregate per batch is printed
2. Total asphalt binder weight per batch is printed
3. Zero tolerance weight is printed before weighing the first batch and after weighing the last batch for each truckload
4. Time, date, mix number, load number, and truck identification are correlated with a load slip
5. Copy of the recorded batch weights is certified by a licensed weighmaster

37-2.02 ASPHALTIC EMULSION CHIP SEALS

37-2.02A General

37-2.02A(1) Summary

Section 37-2.02 includes specifications for applying asphaltic emulsion chip seals. An asphaltic emulsion chip seal includes applying an asphaltic emulsion, followed by aggregate, and then a flush coat.

A double asphaltic emulsion chip seal is the application of an asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

37-2.02A(2) Definitions

Reserved

37-2.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic containers of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-2.02A(4) Quality Assurance

37-2.02A(4)(a) General

Reserved

37-2.02A(4)(b) Quality Control

37-2.02A(4)(b)(i) General

Reserved

37-2.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsion in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples in a plastic container with lined sealed lid for acceptance testing.

For asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

| Quality characteristic | Test method | Minimum sampling and testing frequency | Sampling location |
|-----------------------------------------------------------|-------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Distributor truck |
| Sieve Test (%) | | | |
| Storage stability, 1 day (%) | | | |
| Residue by distillation (%) | | | |
| Particle charge ^a | | | |
| Tests on Residue from Distillation Test: | | | |
| Penetration, 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Distributor truck |
| Ductility | AASHTO T 51 | | |
| Solubility in trichloroethylene | AASHTO T 44 | | |

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-2.02A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department’s sampling and testing for compliance with the requirements shown in the following table:

Aggregate Gradation Acceptance Criteria

| Quality characteristic | Test method | Requirement | | |
|---------------------------------|---------------------|-------------|-------|-------|
| Gradation (% passing by weight) | California Test 202 | 3/8" | 5/16" | 1/4" |
| Sieve size: | | | | |
| 3/4" | | -- | -- | -- |
| 1/2" | | 100 | -- | -- |
| 3/8" | | 85–100 | 100 | 100 |
| No. 4 | | 0–15 | 0–50 | 60–85 |
| No. 8 | | 0–5 | 0–15 | 0–25 |
| No. 16 | | -- | 0–5 | 0–5 |
| No. 30 | | -- | 0–3 | 0–3 |
| No. 200 | | 0–2 | 0–2 | 0–2 |

37-2.02B Materials

37-2.02B(1) General

Reserved

37-2.02B(2) Asphaltic Emulsions

Reserved

37-2.02B(3) Aggregate

Aggregate gradation for an asphaltic emulsion chip seal must comply with the requirements shown in the following table:

| Asphaltic Emulsion Chip Seal Aggregate Gradation | | | | |
|---------------------------------------------------------|------------------------|-------------|-------|-------|
| Quality characteristic | Test method | Requirement | | |
| Gradation (% passing by weight) | California Test 202 | 3/8" | 5/16" | 1/4" |
| Sieve size: | | | | |
| 3/4" | | -- | -- | -- |
| 1/2" | | 100 | -- | -- |
| 3/8" | | 85-100 | 100 | 100 |
| No. 4 | | 0-15 | 0-50 | 60-85 |
| No. 8 | | 0-5 | 0-15 | 0-25 |
| No. 16 | | -- | 0-5 | 0-5 |
| No. 30 | | -- | 0-3 | 0-3 |
| No. 200 | 0-2 | 0-2 | 0-2 | |

37-2.02C Construction

37-2.02C(1) General

Reserved

37-2.02C(2) Asphaltic Emulsions

Asphaltic emulsions must be applied within the application rate ranges shown in the following table:

| Asphaltic Emulsion Application Rates | |
|---------------------------------------------|---------------------------------------|
| Aggregate gradation | Application rate range (gal/sq yd) |
| 3/8" | 0.30-0.45 |
| 5/16" | 0.25-0.35 |
| 1/4" | 0.20-0.30 |

For double asphaltic emulsion chip seals, the asphaltic emulsions must be applied within the application rates shown in the following table:

| Asphaltic Emulsion Application Rates | |
|---------------------------------------------|---------------------------------------|
| Double chip seals | Application rate range (gal/sq yd) |
| 1st application | 0.30-0.45 |
| 2nd application | 0.20-0.30 |

When applied, the temperature of the asphaltic emulsions must be from 130 to 180 degrees F.

Apply asphaltic emulsions when the ambient air temperature is from 65 to 110 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

37-2.02C(3) Spreading Aggregates

Aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate gradation | Spread rate range (lb/sq yd) |
|---------------------|------------------------------|
| 3/8" | 20–30 |
| 5/16" | 16–25 |
| 1/4" | 12–20 |

For double asphaltic emulsion chip seals, aggregate must be spread within the spread rate ranges shown in the following table:

| Double chip seal | Spread rate range (lb/sq yd) |
|------------------|------------------------------|
| 1st application | 23–30 |
| 2nd application | 12–20 |

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for asphaltic emulsion chip seals if you prevent contamination. Aggregate must have a damp surface at spreading. If water visibly separates from the aggregate, do not spread. You may re-dampen aggregate in the delivery vehicle.

Spread aggregate before an asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

37-2.02D Payment

Not Used

37-2.03 POLYMER MODIFIED ASPHALTIC EMULSION CHIP SEALS

37-2.03A General

37-2.03A(1) Summary

Section 37-2.03 includes specifications for applying polymer modified asphaltic emulsion chip seals. A polymer modified asphaltic emulsion chip seal includes applying a polymer modified asphaltic emulsion, followed by aggregate, and then a flush coat.

A double polymer modified asphaltic emulsion chip seal is the application of a polymer modified asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

37-2.03A(2) Definitions

Reserved

37-2.03A(3) Submittals

Immediately after sampling, submit two 1-quart cans of polymer modified asphaltic emulsion taken in the presence of the Engineer. A sample must be submitted in an insulated shipping container.

37-2.03A(4) Quality Assurance

37-2.03A(4)(a) General

Reserved

37-2.03A(4)(b) Quality Control

37-2.03A(4)(b)(i) General

Reserved

37-2.03A(4)(b)(ii) Polymer Modified Asphaltic Emulsions

Circulate polymer modified asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples for acceptance testing.

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Polymer Modified Asphaltic Emulsion

| Quality characteristic | Test method | Minimum sampling and testing frequency | Sampling location |
|-----------------------------------------------------------|---------------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 50 °C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Distributor truck |
| Settlement, 5 days (max, %) | | | |
| Storage stability test, 1 day (max, %) | | | |
| Sieve test (max, %) | | | |
| Demulsibility (min, %) | | | |
| Particle charge | | | |
| Ash content (max, %) | | | |
| Residue by evaporation (min, %) | California Test 331 | | |
| Tests on residue from evaporation test: | | | |
| Penetration, 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Distributor truck |
| Penetration, 4 °C, 200g for 60 seconds | AASHTO T 49 | | |
| Ductility, 25 °C (min, mm) | AASHTO T 51 | | |
| Torsional recovery (min, %) | California Test 332 | | |
| Ring and Ball Softening Point (min, °F) | AASHTO T 53 | | |

37-2.03A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Aggregate Gradation Acceptance Criteria

| Quality characteristic | Test method | Requirement | | |
|---------------------------------|------------------------|-------------|-------|-------|
| Gradation (% passing by weight) | California Test 202 | 3/8" | 5/16" | 1/4" |
| Sieve size: | | | | |
| 3/4" | | -- | -- | -- |
| 1/2" | | 100 | -- | -- |
| 3/8" | | 85–100 | 100 | 100 |
| No. 4 | | 0–15 | 0–50 | 60–85 |
| No. 8 | | 0–5 | 0–15 | 0–25 |
| No. 16 | | -- | 0–5 | 0–5 |
| No. 30 | | -- | 0–3 | 0–3 |
| No. 200 | 0–2 | 0–2 | 0–2 | |

37-2.03B Materials

37-2.03B(1) General

Reserved

37-2.03B(2) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must include elastomeric polymer.

A polymer modified asphaltic emulsion must be Grade PMRS2, PMRS2h, PMCRS2, or PMCRS2h. Polymer content in percent by weight does not apply.

A polymer modified asphaltic emulsion must comply with section 94 and the quality characteristic requirements in the following table:

Polymeric Asphaltic Emulsion

| Quality characteristic | Test method | Requirement |
|----------------------------------------------|-------------|-------------|
| Penetration, 4 °C, 200g for 60 seconds (min) | AASHTO T 49 | 6 |
| Ring and Ball Softening Point (min, °F) | AASHTO T 53 | 135 |

37-2.03B(3) Aggregate

The aggregate gradation for a polymer modified asphaltic emulsion chip seal must comply with the requirements shown in the following table:

Asphaltic Emulsion Chip Seal Aggregate Gradation

| Quality characteristic | Test method | Requirement | | |
|---------------------------------|------------------------|-------------|-------|-------|
| Gradation (% passing by weight) | California Test 202 | 3/8" | 5/16" | 1/4" |
| Sieve Size | | | | |
| 3/4" | | -- | -- | -- |
| 1/2" | | 100 | -- | -- |
| 3/8" | | 85–100 | 100 | 100 |
| No. 4 | | 0–15 | 0–50 | 60–85 |
| No. 8 | | 0–5 | 0–15 | 0–25 |
| No. 16 | | -- | 0–5 | 0–5 |
| No. 30 | | -- | 0–3 | 0–3 |
| No. 200 | | 0–2 | 0–2 | 0–2 |

37-2.03C Construction

Polymer modified asphaltic emulsions must be applied within the application rate ranges shown in the following table:

| Polymer Modified Asphaltic Emulsion Application Rates | |
|--------------------------------------------------------------|------------------------------------|
| Aggregate gradation | Application rate range (gal/sq yd) |
| 3/8" | 0.30–0.45 |
| 5/16" | 0.25–0.35 |
| 1/4" | 0.20–0.30 |

For double polymer modified asphaltic emulsion chip seals, polymer modified asphaltic emulsions must be applied within the application rates shown in the following table:

| Polymer Modified Asphaltic Emulsion Application Rates | |
|--------------------------------------------------------------|------------------------------------|
| Double application | Application rate range (gal/sq yd) |
| 1st application | 0.30–0.45 |
| 2nd application | 0.20–0.30 |

Apply polymer modified asphaltic emulsions when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply polymer modified asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

Aggregate must be spread within the spread rate ranges shown in the following table:

| Aggregate Spread Rates | |
|-------------------------------|------------------------------|
| Chip seal type | Spread rate range (lb/sq yd) |
| 3/8" | 20–30 |
| 5/16" | 16–25 |
| 1/4" | 12–20 |

For double chip seals, aggregate must be spread within spread rate ranges shown in the following table:

| Aggregate Spread Rates | |
|-------------------------------|------------------------------|
| Double application | Spread rate range (lb/sq yd) |
| 1st application | 23–30 |
| 2nd application | 12–20 |

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for the polymer modified asphaltic emulsion chip seals if you prevent contamination. Aggregate must have damp surfaces at spreading. If water visibly separates from the aggregate, do not spread. You may redampen aggregate in the delivery vehicle.

Spread aggregate before the polymer modified asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

37-2.03D Payment

Not Used

37-2.04 ASPHALT RUBBER BINDER CHIP SEALS

37-2.04A General

37-2.04A(1) Summary

Section 37-2.04 includes specifications for applying asphalt rubber binder chip seals.

An asphalt rubber binder chip seal consists of applying asphalt rubber binder followed by heated aggregate precoated with asphalt binder followed by a flush coat.

37-2.04A(2) Definitions

crumb rubber modifier: Combination of ground or granulated high natural scrap tire crumb rubber and scrap tire crumb rubber derived from waste tires described in Pub Res Code § 42703.

descending viscosity reading: Subsequent viscosity reading at least 5 percent lower than the previous viscosity reading.

high natural scrap tire crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of vehicle tires or tire buffing.

37-2.04A(3) Submittals

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder field blending equipment and application equipment. If an air quality permit is not required by the local air district for producing asphalt rubber binder, submit verification from the local air district that an air quality permit is not required.

For each delivery of asphalt rubber binder ingredients to the job site, submit a certificate of compliance with a copy of the specified test results.

Submit a certified volume or weight slip for each delivery of asphalt rubber binder ingredients and asphalt rubber binder.

Submit a SDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

1. Samples of each asphalt rubber binder ingredient:
 - 1.1. 2 lbs of scrap tire crumb rubber
 - 1.2. 2 lbs of high natural scrap tire crumb rubber
 - 1.3. Two 1-quart cans of base asphalt binder
 - 1.4. Two 1-quart cans of asphalt modifier
2. Asphalt rubber binder formulation and data as follows:
 - 2.1. For asphalt modifier, include:
 - 2.1.1. Source of asphalt modifier
 - 2.1.2. Type of asphalt modifier
 - 2.1.3. Percentage of asphalt modifier by weight of asphalt binder
 - 2.1.4. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
 - 2.1.5. Test results for the specified quality characteristics
 - 2.2. For crumb rubber modifier, include:
 - 2.2.1. Each source and type of scrap tire crumb rubber and high natural scrap tire crumb rubber
 - 2.2.2. Percentage of scrap tire crumb rubber and high natural scrap tire crumb rubber by total weight of asphalt rubber binder
 - 2.2.3. Test results for the specified quality characteristics

2.3. For asphalt rubber binder, include minimum reaction time and temperature

Immediately after sampling, submit five 1-quart cans of asphalt rubber binder taken in the presence of the Engineer. Sample must be submitted in insulated shipping containers.

Submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

Submit the log of asphalt rubber binder descending viscosity test results within 1 business day after sampling.

Submit asphalt rubber binder quality control viscosity test results within 1 business day after sampling.

37-2.04A(4) Quality Assurance

37-2.04A(4)(a) General

The equipment used in producing asphalt rubber binder and the equipment used in spreading asphalt rubber binder must be permitted for use or exempted by the local air district.

37-2.04A(4)(b) Quality Control

37-2.04A(4)(b)(i) General

Reserved

37-2.04A(4)(b)(ii) Asphalt Modifiers

For asphalt modifiers, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

Asphalt Modifier for Asphalt Rubber Binder

| Quality characteristic | Test method | Frequency |
|------------------------|-------------|----------------|
| Viscosity | ASTM D445 | 1 per shipment |
| Flash point | ASTM D92 | |
| Molecular Analysis: | | |
| Asphaltenes | ASTM D2007 | 1 per shipment |
| Aromatics | ASTM D2007 | |

37-2.04A(4)(b)(iii) Crumb Rubber Modifiers

Sample and test scrap tire crumb rubber and high natural scrap tire crumb rubber separately.

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

Crumb Rubber Modifier

| Quality characteristic | Test method | Frequency |
|----------------------------------------------------------------|---------------------|-----------------|
| Scrap tire crumb rubber gradation | California Test 385 | 1 per 10,000 |
| High natural scrap tire crumb rubber gradation | California Test 385 | 1 per 3,400 lb |
| Wire in CRM | California Test 385 | 1 per 10,000 lb |
| Fabric in CRM | California Test 385 | |
| CRM particle length | -- | |
| CRM specific gravity | California Test 208 | |
| Natural rubber content in high natural scrap tire crumb rubber | ASTM D297 | 1 per 3,400 lb |

37-2.04A(4)(b)(iv) Asphalt Rubber Binders

For asphalt rubber binders, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphalt Rubber Binder Quality Control Requirements

| Quality characteristic | Test method | Sampling location | Frequency |
|------------------------------------------------------------------------|-------------|--------------------|--------------------------------------------|
| Descending viscosity ^a at 375 °F (Pa•s x 10 ⁻³) | ASTM D7741 | Reaction vessel | 1 per lot ^b |
| Viscosity at 375 °F (Pa•s x 10 ⁻³) | ASTM D7741 | Distribution truck | 15 minutes before use per lot ^b |
| Cone penetration at 25 °C (0.10 mm) | ASTM D217 | Distribution truck | 1 per lot ^b |
| Resilience at 25 °C (% rebound) | ASTM D5329 | | |
| Softening point (°C) | ASTM D36 | | |

^aStart taking viscosity readings at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 30 minutes until 2 consecutive descending viscosity readings have been obtained and the final viscosity complies with the specification requirement.

^bA lot is defined in the *MPQP*.

Retain samples from each lot. Test samples for cone penetration, resilience, and softening point for the first 3 lots and if all 3 lots pass, the testing frequency may be reduced to once for every 3 lots.

If QC test results indicate that the asphalt rubber binder does not comply with the specifications, take corrective action and notify the Engineer.

37-2.04A(4)(c) Department Acceptance

37-2.04A(4)(c)(i) General

Reserved

37-2.04A(4)(c)(ii) Asphalt Modifiers

The Department accepts asphalt modifier based on compliance with the requirements shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder

| Quality characteristic | Test method | Requirement |
|-------------------------------------------------------------|-------------|--------------------|
| Viscosity at 100 °C (m ² /s x 10 ⁻⁶) | ASTM D445 | X ± 3 ^a |
| Flash point (min, °C) | ASTM D92 | 207 |
| Molecular Analysis: | | |
| Asphaltenes (max, % by mass) | ASTM D2007 | 0.1 |
| Aromatics (min, % by mass) | ASTM D2007 | 55 |

^aThe symbol "X" is the asphalt modifier viscosity.

37-2.04A(4)(c)(iii) Crumb Rubber Modifiers

Scrap tire CRM and high natural CRM are sampled and tested separately.

The Department accepts scrap tire CRM and high natural CRM based on compliance with the requirements shown in the following table:

Crumb Rubber Modifier for Asphalt Rubber Binder

| Quality characteristic | Test method | Requirement |
|------------------------------------------------|---------------------|-------------|
| Wire in CRM (max, %) | California Test 385 | 0.01 |
| Fabric in CRM (max, %) | California Test 385 | 0.05 |
| CRM particle length (max, in) | -- | 3/16 |
| CRM specific gravity | California Test 208 | 1.1–1.2 |
| Natural rubber content in high natural CRM (%) | ASTM D297 | 40.0–48.0 |

The Department accepts CRM gradation based on the requirements shown in the following table:

Crumb Rubber Modifier Gradation Requirements

| Quality characteristic | Test method | Requirement | | | |
|------------------------------------------------|------------------------|-------------------------|---------------------|--------------------------------------|---------------------|
| | | Scrap tire crumb rubber | | High natural scrap tire crumb rubber | |
| Gradation (% passing by weight) Sieve size: | California Test 385 | Operating range | Contract compliance | Operating range | Contract compliance |
| No. 8 | | 100 | 100 | -- | -- |
| No. 10 | | 95–100 | 90–100 | 100 | 100 |
| No. 16 | | 35–85 | 32–88 | 92–100 | 85–100 |
| No. 30 | | 2–25 | 1–30 | 25–95 | 20–98 |
| No. 50 | | 0–10 | 0–15 | 6–35 | 2–40 |
| No. 100 | | 0–5 | 0–10 | 0–7 | 0–10 |
| No. 200 | | 0–2 | 0–5 | 0–3 | 0–5 |

If a test result for CRM gradation does not comply with the specifications, the Department deducts the corresponding amount for each gradation test as shown in the following table:

| Material | Gradation test result ^a | Deduction |
|--------------------------------------|--------------------------------------------|-----------|
| Scrap tire crumb rubber | Operating range < TR < Contract compliance | \$250 |
| Scrap tire crumb rubber | TR > Contract compliance | \$1,100 |
| High natural scrap tire crumb rubber | Operating range < TR < Contract compliance | \$250 |
| High natural scrap tire crumb rubber | TR > Contract compliance | \$600 |

^aTest Result = TR

Each gradation test for scrap tire crumb rubber represents 10,000 lb or the quantity used in that day's production, whichever is less.

Each gradation test for high natural scrap tire crumb rubber represents 3,400 lb or the quantity used in that day's production, whichever is less.

37-2.04A(4)(c)(iv) Asphalt Rubber Binders

For Department acceptance testing, take a sample of asphalt rubber binder in the Engineer's presence every 5 lots or once a day, whichever is greater. Each sample must be in five 1-quart cans with an open top and friction lid.

For an asphalt rubber binder, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Asphalt Rubber Binder

| Quality characteristic | Test method | Requirement |
|-------------------------------------------------------------|-------------|-------------|
| Cone penetration at 25 °C (0.10 mm) | ASTM D217 | 25–60 |
| Resilience at 25 °C (% rebound) | ASTM D5329 | 18–50 |
| Softening point (°C) | ASTM D36 | 55–88 |
| Viscosity at 375 °F (Pa•s x 10 ⁻³) ^a | ASTM D7741 | 1,500–2,500 |

^aPrepare sample for viscosity test under California Test 388.

37-2.04A(4)(c)(v) Precoated Aggregate

The Department accepts precoated aggregate based on compliance with the requirements shown in the following table:

| Precoated Aggregate Gradation Acceptance Criteria | | |
|----------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------|
| Quality Characteristic | Test method | Requirement |
| 1/2" gradation (% passing by weight) Sieve size: 3/4" 1/2" 3/8" No. 4 No. 8 No. 200 | California Test 202 | 100 85-90 0-30 0-5 -- 0-1 |
| 3/8" gradation (% passing by weight) Sieve size: 3/4" 1/2" 3/8" No. 4 No. 8 No. 200 | California Test 202 | 100 95-100 70-85 0-15 0-5 0-1 |

37-2.04B Materials

37-2.04B(1) General

Reserved

37-2.04B(2) Asphalt Binders

Asphalt binder used as the base binder for asphalt rubber binder must comply with the specifications for asphalt binder. Do not modify asphalt binder with polymer.

37-2.04B(3) Asphalt Modifiers

An asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. An asphalt modifier must comply with the requirements shown in the following table:

| Asphalt Modifier for Asphalt Rubber Binder | | |
|---------------------------------------------------|-------------|-------------|
| Quality characteristic | Test method | Requirement |
| Viscosity at 100 °C ($m^2/s \times 10^{-6}$) | ASTM D445 | $X \pm 3^a$ |
| Flash point (min, C.L.O.C., °C) | ASTM D92 | 207 |
| Molecular analysis: | | |
| Asphaltenes by mass (max, %) | ASTM D2007 | 0.1 |
| Aromatics by mass (min, %) | ASTM D2007 | 55 |

^aX denotes the proposed asphalt modifier viscosity from 19 to 36. A change in X requires a new asphalt rubber binder submittal.

37-2.04B(4) Crumb Rubber Modifiers

The CRM to be used must be on the Authorized Materials List for crumb rubber modifier.

The CRM must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural scrap tire crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, it must occur before grinding and granulating. Cryogenically-produced CRM particles must be large enough to be ground or granulated.

The CRM must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of CRM may be added. The CRM must not cause foaming when combined with the asphalt binder and asphalt modifier.

The CRM must comply with the requirements shown in the following table:

Crumb Rubber Modifier for Asphalt Rubber Binder

| Quality characteristic | Test method | Requirement |
|-------------------------------|---------------------|-------------|
| Wire in CRM (max, %) | California Test 385 | 0.01 |
| Fabric in CRM (max, %) | California Test 385 | 0.05 |
| CRM particle length (max, in) | -- | 3/16 |
| CRM specific gravity | California Test 208 | 1.1–1.2 |

The CRM must comply with the requirements shown in the following table:

Crumb Rubber Modifier Requirements

| Quality characteristic | Test method | Requirement | |
|-----------------------------|-------------|-------------------------|--------------------------------------|
| | | Scrap tire crumb rubber | High natural scrap tire crumb rubber |
| Acetone extract (%) | ASTM D297 | 6.0–16.0 | 4.0–16.0 |
| Rubber hydrocarbon (min, %) | | 42.0–65.0 | 50.0 |
| Natural rubber content (%) | | 22.0–39.0 | 40.0–48.0 |
| Carbon black content (%) | | 28.0–38.0 | -- |
| Ash content (max, %) | | 8.0 | -- |

Scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

Scrap Tire Crumb Rubber Gradation

| Quality characteristic | Test method | Requirement | | |
|------------------------------------------------|---------------------|-----------------|-----------------|---------------------|
| | | Gradation limit | Operating range | Contract compliance |
| Gradation (% passing by weight) Sieve size: | California Test 385 | | | |
| No. 8 | | 100 | 100 | 100 |
| No. 10 | | 98–100 | 95–100 | 90–100 |
| No. 16 | | 45–75 | 35–85 | 32–88 |
| No. 30 | | 2–20 | 2–25 | 1–30 |
| No. 50 | | 0–6 | 0–10 | 0–15 |
| No. 100 | | 0–2 | 0–5 | 0–10 |
| No. 200 | | 0 | 0–2 | 0–5 |

High natural scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

High Natural Scrap Tire Crumb Rubber Gradation

| Quality characteristic | Test method | Requirement | | |
|------------------------------------------------|---------------------|-----------------|-----------------|---------------------|
| | | Gradation limit | Operating range | Contract compliance |
| Gradation (% passing by weight) Sieve size: | California Test 385 | | | |
| No. 10 | | 100 | 100 | 100 |
| No. 16 | | 95–100 | 92–100 | 85–100 |
| No. 30 | | 35–85 | 25–95 | 20–98 |
| No. 50 | | 10–30 | 6–35 | 2–40 |
| No. 100 | | 0–4 | 0–7 | 0–10 |
| No. 200 | | 0–1 | 0–3 | 0–5 |

37-2.04B(5) Asphalt Rubber Binders

An asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. Crumb rubber modifier

Asphalt rubber binder blending equipment must be authorized under the Department's *MPQP*.

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

An asphalt rubber binder must be 79 ± 1 percent by weight asphalt binder and 21 ± 1 percent by weight of CRM. The minimum percentage of CRM must be 20.0 percent and lower values must not be rounded up.

The CRM must be 75 ± 2 percent by weight scrap tire crumb rubber and 25 ± 2 percent by weight high natural scrap tire crumb rubber.

An asphalt modifier and asphalt binder must be blended at the production site. An asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder supplier determines the exact percentage.

If blended before adding CRM, the asphalt binder must be from 375 to 440 degrees F when an asphalt modifier is added and the mixture must circulate for at least 20 minutes. An asphalt binder, asphalt modifier, and CRM may be proportioned and combined simultaneously.

The blend of an asphalt binder and an asphalt modifier must be combined with the CRM at the asphalt rubber binder production site. The asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when the CRM is added. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must comply with the requirements shown in the following table:

Asphalt Rubber Binder

| Quality characteristic | Test method | Requirement |
|-------------------------------------------------------------|-------------|-------------|
| Cone penetration at 25 °C (0.10 mm) | ASTM D217 | 25–60 |
| Resilience at 25 °C (% rebound) | ASTM D5329 | 18–50 |
| Softening point (°C) | ASTM D36 | 55–88 |
| Viscosity at 375 °F (Pa•s x 10 ⁻³) ^a | ASTM D7741 | 1,500–2,500 |

^aPrepare sample for viscosity test under California Test 388.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after the 45-minute reaction period. Reheating asphalt rubber binder that cools below 375 degrees F is a reheat cycle. Do not exceed 2 reheat cycles. If reheating, the asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add CRM. The CRM must not exceed 10 percent by weight of the asphalt rubber binder. Allow added CRM to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

37-2.04B(6) Precoated Aggregate

Before precoating with asphalt binder, aggregate for an asphalt rubber binder chip seal must comply with the gradation requirements shown in the following table:

Asphalt Rubber Binder Chip Seal Aggregate Gradation

| Quality characteristic | Test method | Requirement | |
|------------------------------------------------|------------------------|-------------|--------|
| Gradation (% passing by weight) Sieve size: | California Test 202 | 1/2" | 3/8" |
| 3/4" | | 100 | 100 |
| 1/2" | | 85-90 | 95-100 |
| 3/8" | | 0-30 | 70-85 |
| No. 4 | | 0-5 | 0-15 |
| No. 8 | | -- | 0-5 |
| No. 200 | | 0-1 | 0-1 |

37-2.04C Construction

37-2.04C(1) General

Reserved

37-2.04C(2) Equipment

Distributor trucks must be equipped with:

1. Mixing and heating unit
2. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed

37-2.04C(3) Asphalt Rubber Binder Application

Apply the asphalt rubber binder when the ambient temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply the asphalt rubber binder unless enough aggregate is available at the job site to cover the asphalt rubber binder within 2 minutes. Intersections, turn lanes, gore points, and irregular areas must be covered within 15 minutes.

Do not apply asphalt rubber binder when pavement is damp or during high wind conditions. If authorized, you may adjust the distributor bar height and distribution speed and use shielding equipment during high wind conditions.

When applied, the temperature of the asphalt rubber binder must be from 385 to 415 degrees F.

Apply the asphalt rubber binder at a rate from 0.55 to 0.65 gal/sq yd. You may reduce the application rate by 0.050 gal/sq yd in the wheel paths.

37-2.04C(4) Precoated Aggregate Spreading

Spread aggregate at a rate from 28 to 40 lb/sq yd. Do not spread aggregate more than 200 feet ahead of the completed initial rolling.

37-2.04C(5) Rolling and Sweeping

Perform initial rolling within 90 seconds of spreading aggregate. If authorized for final rolling, you may use a steel-wheeled roller weighing from 8 to 10 tons in static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge aggregate.

37-2.04D Payment

Asphalt rubber binder is measured as specified for asphalt binder.

37-2.05 STRESS ABSORBING MEMBRANE INTERLAYERS

37-2.05A General

Section 37-2.05 includes specifications for placing stress absorbing membrane interlayers (SAMI).

Comply with section 37-2.04 except a flush coat is not required.

Traffic must not be allowed on a SAMI.

37-2.05B Materials

For a SAMI, aggregate must comply with the 3/8-inch gradation.

37-2.05C Construction

If a SAMI is overlaid in the same work shift, section 37-2.01C(4)(e) does not apply.

Final sweeping is not required for a SAMI.

37-2.05D Payment

Not Used

37-2.06 MODIFIED ASPHALT BINDER CHIP SEALS

Reserved

37-2.07 SCRUB SEALS

Reserved

37-3 SLURRY SEALS AND MICRO-SURFACINGS

37-3.01 GENERAL

37-3.01A General

37-3.01A(1) Summary

Section 37-3.01 includes general specifications for applying slurry seals and micro-surfacings.

37-3.01A(2) Definitions

Reserved

37-3.01A(3) Submittals

At least 15 days before starting placement of a slurry seal or micro-surfacing, submit:

1. Samples for:
 - 1.1. Asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
 - 1.2. Polymer modified asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion

- 1.3. Micro-surfacing, two 1-quart wide mouth plastic containers with screw top lid of micro-surfacing emulsion
2. Asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion data as follows:
 - 2.1. Supplier and Type/Grade of asphaltic emulsion
 - 2.2. Type of modifier polymer for polymer modified asphaltic emulsion or micro-surfacing emulsion
 - 2.3. Copy of the specified test results for asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion
3. 50 lb of aggregate
4. Aggregate test results for the followings:
 - 4.1. Gradation
 - 4.2. Los Angeles Rattler
 - 4.3. Percent of crushed particles
 - 4.4 Sand equivalent
 - 4.5 Durability

At least 10 days before starting placement of a slurry seal or micro-surfacing, submit a laboratory report of test results and the proposed mix design from an authorized laboratory. The authorized laboratory must sign the laboratory report and mix design.

The report must include:

1. Test results used in the mix design compared with specification requirements
2. Proportions based on the dry weight of aggregate, including ranges, for:
 - 2.1. Aggregate
 - 2.2. Water
 - 2.3. Additives
 - 2.4. Mineral filler
 - 2.5. Slurry seal emulsion or micro-surfacing emulsion residual asphalt content
3. Recommended changes to the proportions based on heating the mixture to 100 degrees F and mixing for 60 seconds, if atmospheric temperatures during application will be 90 degrees F or above, for:
 - 3.1. Water
 - 3.2. Additives
 - 3.3. Mineral filler
4. Quantitative moisture effects on the aggregate's unit weight determined under ASTM C29M

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you change any of the materials in the mix design, submit a new mix design and laboratory report at least 10 days before starting slurry seal or micro-surfacing work.

Submit a certificate of compliance as specified for asphaltic emulsion in section 94-1.01C with each shipment of asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

Quality Control Test Reporting Requirements

| Quality characteristic | Maximum reporting time allowance |
|---------------------------------------------------------------------------------------------------------|----------------------------------|
| Los Angeles Rattler loss (max, %) | 2 business days |
| Percent of crushed particles (min, %) | 2 business days |
| Durability (min) | 2 business days |
| Resistance of fine aggregate to degradation by abrasion in the Micro-Deval Apparatus (% loss by weight) | 2 business days |
| Gradation (% passing by weight) | 48 hours |
| Sand equivalent (min) | 48 hours |
| Moisture content (%) | 48 hours |

Within 3 days after taking asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion quality control samples, submit the authorized laboratory's test results.

37-3.01A(4) Quality Assurance

37-3.01A(4)(a) General

Your authorized laboratory must be able to perform International Slurry Surfacing Association tests and mix design.

37-3.01A(4)(b) Quality Control

37-3.01A(4)(b)(i) General

Reserved

37-3.01A(4)(b)(ii) Aggregate

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Aggregate Quality Control

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|---------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|-------------------------|
| Los Angeles Rattler loss (max, %) At 500 revolutions | California Test 211 | 1st day of production | See California Test 125 |
| Percent of crushed particles (min, %) | AASHTO T 335 | 1st day of production | See California Test 125 |
| Sand equivalent (min) | California Test 217 | 1 per working stockpile per day | See California Test 125 |
| Resistance of fine aggregate to degradation by abrasion in the Micro-Deval Apparatus (% loss by weight) | ASTM D7428 | 1 per working stockpile per day | See California Test 125 |
| Gradation (% passing by weight) | California Test 202 | 1 per working stockpile per day | See California Test 125 |
| Moisture content, from field stockpile (%) | AASHTO T 255 ^a | 1 per working stockpile per day | See California Test 125 |

^aTest aggregate moisture at field stockpile every 2 hours if you are unable to maintain the moisture content to within a maximum daily variation of ±0.5 percent.

37-3.01A(4)(b)(iii) Slurry Seals and Micro-surfacings

Reserved

37-3.01A(4)(c) Department Acceptance

Slurry Seal and micro-surfacing acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits.
 - 1.2. Marks in the surface:
 - 1.2.1. Up to 4 marks in the completed slurry seal or micro-surfacing surface that are up to 1 inch wide and up to 6 inches long per 1000 square feet of slurry seal or micro-surfacing placed.
 - 1.2.2. No marks in the completed slurry seal or micro-surfacing surface that are over 1 inch wide or 6 inches long.
 - 1.3. Excessive raveling consisting of the separation of the aggregate from the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.
 - 1.4. Bleeding consists of the occurrence of a film of asphaltic material on the surface of the slurry seal or micro-surfacing.
 - 1.5. Delaminating of slurry seal or micro-surfacing from the existing pavement.
 - 1.6. Rutting or wash-boarding.
2. Department's sampling and testing for compliance with the requirements for aggregate shown in the following table:

Aggregate Gradation Acceptance Criteria

| Quality characteristic | Test method | Requirements | | |
|------------------------------------------------|------------------------|--------------|---------|----------|
| Gradation (% passing by weight) Sieve Size: | California Test 202 | Type I | Type II | Type III |
| 3/8" | | -- | 100 | 100 |
| No. 4 | | 100 | 94-100 | 70-90 |
| No. 8 | | 90-100 | 65-90 | 45-70 |
| No. 16 | | 60-90 | 40-70 | 28-50 |
| No. 30 | | 40-65 | 25-50 | 19-34 |
| No. 200 | | 10-20 | 5-15 | 5-15 |

An aggregate gradation test represents 300 tons or 1 day's production, whichever is less.

If test results for aggregate gradation do not comply with the specifications, you may remove the slurry seal or micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts:

1. \$1.75 per ton of slurry seal for each noncompliant aggregate gradation
2. \$2.00 per ton of micro-surfacing for each noncompliant aggregate gradation

37-3.01B Materials

37-3.01B(1) General

Additional water must not cause separation of the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion from the aggregate before placement.

You may use an additive that does not adversely affect the slurry seal or micro-surfacing.

37-3.01B(2) Aggregate

Aggregate must be rock dust. Aggregate must be free from vegetable matter, deleterious substances, caked or clay lumps, and oversized particles.

Aggregate for a slurry seal and micro-surfacing must comply with the gradations shown in the following table:

Aggregate Gradation

| Quality characteristic | Test method | Requirements | | |
|---------------------------------|------------------------|--------------|---------|----------|
| Gradation (% passing by weight) | California Test 202 | Type I | Type II | Type III |
| Sieve size: | | | | |
| 3/8" | | -- | 100 | 100 |
| No. 4 | | 100 | 94–100 | 70–90 |
| No. 8 | | 90–100 | 65–90 | 45–70 |
| No. 16 | | 60–90 | 40–70 | 28–50 |
| No. 30 | | 40–65 | 25–50 | 19–34 |
| No. 200 | | 10–20 | 5–15 | 5–15 |

37-3.01C Construction

37-3.01C(1) General

Before applying slurry seals or micro-surfacings, cover manholes, valve and monument covers, grates, and other exposed facilities located within the area of application using plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after application of the slurry seals or micro-surfacings.

37-3.01C(2) Proportioning

Proportion slurry seal and micro-surfacing ingredients in compliance with the authorized mix design.

37-3.01C(3) Mixing and Spreading Equipment

37-3.01C(3)(a) General

Mixing and spreading equipment for slurry seals and micro-surfacings must proportion the asphaltic emulsions, water, aggregate, and any additives by volume and mix them in continuous pug mill mixers.

Introduce emulsions into the mixer with a positive displacement pump. If you use a variable-rate pump, the adjusting unit must be sealed in its calibrated position.

Introduce water into the mixer through a meter that measures gallons.

Choose a truck mounted mixer-spreader or continuous self-loading mixer spreader.

37-3.01C(3)(b) Truck Mounted Mixer Spreaders

Truck mounted mixer spreaders must comply with:

1. Rotating and reciprocating equipment must be covered with metal guards.
2. Proportion aggregate using a belt feeder with an adjustable cutoff gate. The Engineer verifies the height of the gate opening.
3. Belt feeder must have a depth monitor device. The depth monitor device must automatically shut down power to the belt feeder when the aggregate depth is less than 70 percent of the target depth.
4. Separate monitor device must detect the revolutions of the belt feeder. This device must automatically shut down power to the belt feeder if it detects no revolutions. If the belt feeder is an integral part of the equipment's drive chain, the monitor device is not required.
5. Aggregate belt feeder must be connected directly to the drive on the emulsion pump. The aggregate feeder drive shaft must have a revolution counter reading the nearest 0.10 revolution for micro-surfacing, and nearest 1 revolution for slurry seal.
6. Emulsion storage must be equipped with a device that automatically shuts down power to the emulsion pump and aggregate belt feeder when the level of stored emulsion is lowered. To allow for normal fluctuations, there may be a delay of 3 seconds between detection of low emulsion storage levels or low aggregate depths and automatic power shut down.
7. Emulsion storage must be located immediately before the emulsion pump.

8. Emulsion storage tank must have a temperature indicator at the pump suction level. The indicator must be accurate to ± 5 degrees F.
9. No-flow and revolution warning devices must be in working condition. Low-flow indicators must be visible while walking alongside the equipment.

37-3.01C(3)(c) Continuous Self-Loading Mixer Spreaders

Continuous self-loading mixer spreaders must be automatically sequenced and self-propelled. The mixing machine must deliver each material to a double shafted mixer and discharge the mixed material on a continuous flow basis. The mixing machines must have sufficient storage capacity to maintain a continuous supply of material to the proportioning controls. The mixing machine operators must have full control of forward and reverse speeds during placement.

37-3.01C(3)(d) Spreader Boxes

The spreader boxes used to spread slurry seals and micro-surfacings must be:

1. Capable of spreading the slurry seal or micro-surfacing a minimum of 12 feet wide and preventing the loss of slurry seal or micro-surfacing.
2. Equipped with flexible rubber belting on each side. The belting must contact the pavement to prevent the loss of slurry seal or micro-surfacing from the box.
3. Equipped to uniformly apply the slurry seal or micro-surfacing on superelevated sections and shoulder slopes. Micro-surfacing spreader box must be equipped with reversible motor driven augers.
4. Equipped with a series of strike-off devices at its rear.
 - 4.1. The leading strike off device must be:
 - 4.1.1. Fabricated of a suitable material such as steel or stiff rubber
 - 4.1.2. Designed to maintain close contact with the pavement during spreading
 - 4.1.3. Capable of obtaining the specified thickness
 - 4.1.4. Capable of being adjusted to the various pavement cross sections
 - 4.2. The final strike-off device must be:
 - 4.2.1. Fabricated of flexible material that produces a uniform texture in the finished surface
 - 4.2.2. Cleaned daily and changed if longitudinal scouring occurs in the slurry seal or micro-surfacing
5. Clean and free of slurry seal or micro-surfacing at the start of each work shift.

37-3.01C(3)(e) Shoulder Equipment

Spread the slurry seal or micro-surfacing on shoulders with a device such as an edge box that forms clean and straight joints and edges.

37-3.01C(3)(f) Equipment Calibration

Equipment calibration must comply with the *MPQP*. Notify the Engineer at least 5 business days before calibrating.

If the Department authorizes a truck or continuous mixer spreader, its calibration is valid for 6 months provided you:

1. Use the same truck or continuous mixer spreader verified with a unique identifying number
2. Use the same materials in compliance with the authorized mix design
3. Do not perform any repair or alteration to the proportioning systems

Calibrate the adjustable cut-off gate settings of each truck or continuous mixer spreader on the project to achieve the correct delivery rate of aggregate and emulsion per revolution of the aggregate feeder under the *MPQP*.

Checks must be performed for each aggregate source using an authorized vehicle scale.

Individual checks of the aggregate belt feeder's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 3 tons each.

Before using a variable-rate emulsion pump, the pump must be calibrated and sealed in the calibrated condition under the *MPQP*.

Individual checks of the emulsion pump's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 500 gal each.

37-3.01C(4) Surface Preparation

Immediately before applying slurry seals or micro-surfacings, clean the surface to receive slurry seals or micro-surfacings by removing any extraneous material affecting adhesion of the slurry seal or micro-surfacing with the existing surface. Use self-propelled power brooms or other methods such as flushing to clean the existing pavement.

37-3.01C(5) Placement

37-3.01C(5)(a) General

If truck-mounted mixer-spreaders are used, keep at least 2 operational spreaders at the job site during placement.

Spread slurry seals and micro-surfacings uniformly and do not spot, rehandle, or shift the mixture. However in areas inaccessible to spreading equipment, spread the slurry seal or micro-surfacing mixtures with hand tools or other authorized methods. If placing with hand tools, lightly dampen the area first.

You may fog the roadway surface with water ahead of the spreader box. The fog spray must be adjusted for pavement:

1. Temperature
2. Surface texture
3. Dryness

You determine the application rates for slurry seals or micro-surfacings and the Engineer authorizes the application rates. Spread within 10 percent of authorized rate.

The mixtures must be uniform and homogeneous after spreading, and there must not be separation of the emulsion and aggregate after setting.

37-3.01C(5)(b) Weather Conditions

Only place slurry seals or micro-surfacings if both the pavement and air temperatures are at least 50 degrees F and rising. The expected high temperature must be at least 65 degrees F within 24 hours after placement.

Do not place slurry seals or micro-surfacings if rain is imminent or the air temperature is expected to be below 36 degrees F within 24 hours after placement.

37-3.01C(5)(c) Joints

Transverse and longitudinal joints must be:

1. Uniform
2. Straight
3. Neat in appearance
4. Without material buildup
5. Without uncovered areas

Transverse joints must be butt-type joints.

Prevent double placement at transverse joints over previously placed slurry seals or micro-surfacings.

Place longitudinal joints:

1. On centerlines, lane lines, edge lines, or shoulder lines

2. With overlaps not more than 4 inches

You may request other longitudinal joint patterns if they do not adversely affect the slurry seals or micro-surfacings.

The maximum difference between the pavement surface and the bottom edge of a 12-foot straightedge placed perpendicular to the longitudinal joint must be 0.04 foot.

37-3.01C(5)(d) Finished Surfaces

Finished slurry seals or micro-surfacings must be smooth and free of irregularities such as scratch or tear marks. You may leave up to 4 marks that are up to 1 inch wide and 6 inches long per 75 linear feet of slurry seal or micro-surfacing placed. Do not leave any marks that are over 1 inch wide or 6 inches long.

37-3.01C(5)(e) Maintenance Sweeping

Sweep the slurry seals or micro-surfacings 24 hours after placement without damaging the slurry seals or micro-surfacings. For 4 days afterwards, sweep the slurry seals or micro-surfacings daily unless determined otherwise by the Engineer.

37-3.01C(5)(f) Repair of Early Distress

The slurry seals or micro-surfacings must not show bleeding, raveling, separation, or other distresses for 15 days after placing. If bleeding, raveling, delaminating, rutting, or wash-boarding occurs after placing the slurry seals or micro-surfacings, make repairs using an authorized method.

37-3.01D Payment

Not Used

37-3.02 SLURRY SEALS

37-3.02A General

37-3.02A(1) Summary

Section 37-3.02 includes specifications for applying slurry seals.

Applying a slurry seal consists of spreading a mixture of asphaltic emulsion or polymer modified asphaltic emulsion, aggregate, additives, and water on a surface or pavement.

37-3.02A(2) Definitions

Reserved

37-3.02A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of asphaltic emulsion or polymer modified asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

37-3.02A(4) Quality Assurance

37-3.02A(4)(a) General

Reserved

37-3.02A(4)(b) Quality Control

37-3.02A(4)(b)(i) General

Take samples of asphaltic emulsion and polymer modified asphaltic emulsion from the tank truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer take two 1-quart samples in wide mouth plastic containers with lined, sealed lids for acceptance testing.

37-3.02A(4)(b)(ii) Asphaltic Emulsion

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

| Quality characteristic | Test method | Minimum sampling and testing frequency | Sampling location |
|-----------------------------------------------------------|-------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Delivery truck |
| Sieve Test (%) | | | |
| Storage stability, 1 day (%) | | | |
| Residue by distillation (%) | | | |
| Particle charge ^a | | | |
| Tests on Residue from Distillation Test: | | | |
| Penetration, 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Delivery truck |
| Ductility | AASHTO T 51 | | |
| Solubility in trichloroethylene | AASHTO T 44 | | |

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-3.02A(4)(b)(iii) Polymer Modified Asphaltic Emulsion

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Polymer Modified Asphaltic Emulsion

| Quality characteristic | Test method | Minimum sampling and testing frequency | Sampling Location |
|----------------------------------------------------------|---------------------|----------------------------------------|-------------------|
| Tests on emulsion: | | | |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Delivery truck |
| Sieve test (%) | AASHTO T 59 | | |
| Storage stability after 1 day (%) | AASHTO T 59 | | |
| Residue by evaporation (min, %) | California Test 331 | | |
| Particle charge | AASHTO T 59 | | |
| Tests on residue by evaporation: | | | |
| Penetration at 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Delivery truck |
| Ductility at 25 °C (min, mm) | AASHTO T 51 | | |
| Torsional recovery (min, %) | California Test 332 | | |
| Or | | | |
| Polymer content based on residual asphalt (min, %) | California Test 401 | | |

37-3.02A(4)(c) Department Acceptance

For a slurry seal asphaltic emulsion and polymer modified asphaltic emulsion, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

| Aggregate Acceptance Criteria | | |
|---------------------------------------------------------|----------------------------------|-------------|
| Quality characteristic | Test method | Requirement |
| Los Angeles Rattler loss (max, %) At 500 revolutions | California Test 211 ^a | 35 |
| Percent of crushed particles (min, %) | California Test 205 | 95 |
| Durability (min) | California Test 229 | 55 |
| Sand equivalent (min) | | |
| Type I | California Test 217 | 45 |
| Type II | | 55 |
| Type III | | 60 |

^aCalifornia Test 211 must be performed on the source aggregate before crushing.

A sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If test results for sand equivalent do not comply with the specifications, you may remove the slurry seal represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$1.75 per ton of slurry seal for each noncompliant sand equivalent test.

37-3.02B Materials

37-3.02B(1) General

Reserved

37-3.02B(2) Asphaltic Emulsions

An asphaltic emulsion must comply with the requirements in Section 94. The asphaltic emulsion must be Grade CQS1h.

37-3.02B(3) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must:

1. Consist of an elastomeric polymer mixed with an asphaltic material uniformly emulsified with water and an emulsifying or stabilization agent.
2. Use either neoprene polymer or butadiene and styrene copolymer. The polymer must be homogeneous and milled into the asphaltic emulsion at the colloid mill.
3. Be Grade PMCQS1h and must comply with the requirements shown in the following table:

Polymer Modified Asphaltic Emulsion Requirements

| Quality characteristic | Test method | Requirement |
|----------------------------------------------------------|---------------------|-------------|
| Tests on emulsion: | | |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | 15–90 |
| Sieve test (%) | AASHTO T 59 | 0–0.3 |
| Storage stability after 1 day (%) | AASHTO T 59 | 0–1 |
| Residue by evaporation (min, %) | California Test 331 | 60 |
| Particle charge | AASHTO T 59 | Positive |
| Tests on residue by evaporation: | | |
| Penetration at 25 °C | AASHTO T 49 | 40–90 |
| Ductility at 25 °C (min, mm) | AASHTO T 51 | 400 |
| Torsional recovery (min, %) | California Test 332 | 18 |
| Or | | |
| Polymer content based on residual asphalt (min, %) | California Test 401 | 2.5 |

37-3.02B(4) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

Aggregate Requirements

| Quality characteristic | Test method | Requirement |
|------------------------------------------------------|----------------------------------|-------------|
| Los Angeles Rattler loss (max, %) At 500 revolutions | California Test 211 ^a | 35 |
| Percent of crushed particles (min, %) | California Test 205 | 95 |
| Durability (min) | California Test 229 | 55 |
| Sand equivalent (min) | | |
| Type I | California Test 217 | 45 |
| Type II | | 55 |
| Type III | | 60 |

^aCalifornia Test 211 must be performed on the source aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

37-3.02B(5) Slurry Seal Mix Design

The slurry seal mix design, using project source aggregate, an asphaltic emulsion, and set-control agents if any, must comply with the requirements shown in the following table:

Slurry Seal Mix Design Requirements

| Quality characteristic | Test method ^a | Requirement |
|---------------------------------------------|--------------------------|-------------------|
| Consistency (max, mm) | Technical Bulletin 106 | 30 |
| Wet stripping | Technical Bulletin 114 | Pass |
| Compatibility | Technical Bulletin 115 | Pass ^b |
| Cohesion test, within 1 hour (min, kg-mm) | Technical Bulletin 139 | 200 |
| Wet track abrasion (max, g/m ²) | Technical Bulletin 100 | 810 |

^aTest methods are by the International Slurry Surfacing Association.

^bMixing test must pass at the maximum expected air temperature at the job site during placement.

The mix design must have the percent of asphaltic residue, based on percentage by weight of the dry aggregate, within the ranges shown in the following table:

| Slurry seal type | Residue range |
|------------------|---------------|
| Type I | 10–16 |
| Type II | 7.5–13.5 |
| Type III | 6.5–12.0 |

Determine the exact percentage based on the design asphalt binder content and the asphalt residual content of the asphaltic emulsion furnished.

37-3.02C Construction

37-3.02C(1) General

Reserved

37-3.02C(2) Proportioning

After proportioning, slurry seal mixtures must be workable.

37-3.02C(3) Mixing and Spreading Equipment

Reserved

37-3.02C(4) Placement

The slurry seal spread rates must be within the ranges shown in the following table:

| Slurry Seal Spread Rates | |
|---------------------------------|--------------------------------------------------|
| Slurry seal type | Application range (lb of dry aggregate/sq yd) |
| Type I | 8–12 |
| Type II | 10–18 |
| Type III | 20–25 |

Within 4 hours after placement, slurry seals must be set enough to allow traffic without pilot cars. Protect slurry seals from damage until it has set and will not adhere or be picked up by vehicle tires. Slurry seals must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

37-3.02D Payment

The payment quantity for slurry seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion or polymeric asphaltic emulsion. The payment quantity for slurry seal does not include the weights of the added water and set-control additives.

37-3.03 MICRO-SURFACINGS

37-3.03A General

37-3.03A(1) Summary

Section 37-3.03 includes specifications for applying micro-surfacings.

Applying a micro-surfacing consists of spreading a mixture of a micro-surfacing emulsion, water, additives, mineral filler, and aggregate on the pavement.

37-3.03A(2) Definitions

Reserved

37-3.03A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of micro-surfacing emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-3.03A(4) Quality Assurance

37-3.03A(4)(a) General

Reserved

37-3.03A(4)(b) Quality Control

37-3.03A(4)(b)(i) General

Reserved

37-3.03A(4)(b)(ii) Micro-surfacing Emulsions

Take samples from the truck tank at mid load from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart wide mouth plastic containers for acceptance testing.

For a micro-surfacing emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the quality characteristics shown in the following table:

Micro-Surfacing Emulsion

| Quality characteristic | Test method | Minimum sampling and testing frequency | Sampling location |
|----------------------------------------------------------|---------------------|----------------------------------------|-------------------|
| Tests on emulsion: | | | |
| Saybolt Furol Viscosity, at 25°C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Delivery truck |
| Storage stability, 1 day (max, %) ^a | | | |
| Sieve test (max, %) | | | |
| Residue by evaporation (min, %) | California Test 331 | Minimum 1 per day per delivery truck | Delivery truck |
| Tests on residue from evaporation test: | | | |
| Penetration at 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Delivery truck |
| Softening point (min, °C) | AASHTO T 53 | | |

^aStorage stability test will be run if the storage exceeds 48 hours

37-3.03A(4)(c) Department Acceptance

For micro-surfacing emulsions, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Micro-surfacing Emulsion Acceptance Criteria

| Quality characteristic | Test method | Requirement |
|----------------------------------------------------------|---------------------|-------------|
| Tests on emulsion: | | |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | 15–90 |
| Sieve test (%) | AASHTO T 59 | 0.30 |
| Storage stability, 1 day (max, %) | AASHTO T 59 | 0–1 |
| Settlement ^a , 5 days (max, %) | ASTM D244 | 5 |
| Residue by evaporation (min, %) | California Test 331 | 62 |
| Tests on residue by evaporation: | | |
| Penetration at 25 °C | AASHTO T 49 | 40–90 |
| Softening point (min, °C) | AASHTO T 53 | 57 |

^aSettlement test on emulsion is not required if used within 48 hours of shipment.

Acceptance of aggregate, except mineral filler, is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Aggregate Acceptance Criteria

| Quality characteristic | Test method | Requirement |
|------------------------------------------------------|----------------------------------|-------------|
| Los Angeles Rattler loss (max, %) At 500 revolutions | California Test 211 ^a | 35 |
| Percent of crushed particles (min, %) | California Test 205 | 95 |
| Durability (min) | California Test 229 | 65 |
| Sand equivalent (min) | California Test 217 | |
| Type II | | 65 |
| Type III | | 65 |

^aCalifornia Test 211 must be performed on the aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

An aggregate sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If the test results for aggregate sand equivalent do not comply with the specifications, you may remove the micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$2.00 per ton of micro-surfacing for each noncompliant aggregate sand equivalent test.

37-3.03B Materials

37-3.03B(1) General

Reserved

37-3.03B(2) Micro-surfacing Emulsions

A micro-surfacing emulsion must be a homogeneous mixture of asphalt, an elastomeric polymer and an emulsifier solution.

Add an elastomeric polymer modifier to asphalt or emulsifier solution before emulsification. An elastomeric polymer solid must be a minimum of 3 percent by weight of the micro-surfacing emulsion's residual asphalt.

A micro-surfacing emulsion must comply with the requirements shown in the following table:

Micro-surfacing Emulsion Requirements

| Quality characteristic | Test method | Requirement |
|----------------------------------------------------------|---------------------|-------------|
| Tests on emulsion: | | |
| Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | 15–90 |
| Sieve test (%) | AASHTO T 59 | 0.30 |
| Storage stability, 1 day (max, %) | AASHTO T 59 | 0–1 |
| Settlement ^a , 5 days (max, %) | ASTM D244 | 5 |
| Residue by evaporation (min, %) | California Test 331 | 62 |
| Tests on residue by evaporation: | | |
| Penetration at 25 °C | AASHTO T 49 | 40–90 |
| Softening point (min, °C) | AASHTO T 53 | 57 |

^aSettlement test on emulsion is not required if used within 48 hours of shipment.

37-3.03B(3) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

Aggregate Requirements

| Quality characteristic | Test method | Requirement |
|---------------------------------------------------------|----------------------------------|-------------|
| Los Angeles Rattler loss (max, %) At 500 revolutions | California Test 211 ^a | 35 |
| Percent of crushed particles (min, %) | California Test 205 | 95 |
| Durability (min) | California Test 229 | 65 |
| Sand equivalent (min) | California Test 217 | |
| Type II | | 65 |
| Type III | | 65 |

^aCalifornia Test 211 must be performed on the source aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

37-3.03B(4) Mineral Fillers

If a mineral filler is used, it must be type I or type II Portland cement. A mineral filler used during mix design must be used during production.

37-3.03B(5) Micro-Surfacing Mix Designs

The micro-surfacing mix design must have the material proportion limits shown in the following table:

Micro-surfacing Mix Design Proportion Limits

| Material | Proportion limits |
|----------------------------------------------------------------------------------|-------------------|
| Micro-surfacing emulsion asphalt residual content (% of dry weight of aggregate) | 5.5–10.5 |
| Water and additives | As Required |
| Mineral filler (% of dry weight of aggregate) | 0–3 |

The micro-surfacing mix design must comply with the requirements shown in the following table:

Micro-surfacing Mix Design Requirements

| Quality characteristics | Test method ^a | Requirement |
|----------------------------------------------------------------|--------------------------|-----------------------------|
| Wet cohesion | | |
| At 30 minutes (set) (min, kg-cm) | Technical Bulletin 139 | 12 |
| At 60 minutes (traffic) (min, kg-cm) | | 20 |
| Excess asphalt (max, g/m ²) | Technical Bulletin 109 | 540 |
| Wet stripping (min, %) | Technical Bulletin 114 | 90 |
| Wet track abrasion loss 6-day soak (max, g/m ²) | Technical Bulletin 100 | 810 |
| Displacement | | |
| Lateral (max, %) | Technical Bulletin 147A | 5 |
| Specific gravity after 1000 cycles of 57 kg (max) | | 2.10 |
| Classification compatibility (min, grade points) | Technical Bulletin 144 | (AAA, BAA) 11 |
| Mix time at 25 °C (min) | Technical Bulletin 113 | Controllable to 120 seconds |

^aTest methods are by the International Slurry Surfacing Association.

37-3.03B(6) Tack Coats

If there is a bid item for tack coat, you must coat the pavement surface with an asphaltic emulsion mixed with additional water before applying a micro-surfacing. The maximum ratio of water to asphaltic emulsion

must be 2 to 1. Apply the tack coat at a rate from 0.08 to 0.15 gal/sq yd. The exact rate must be authorized.

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

37-3.03C Construction

37-3.03C(1) General

Reserved

37-3.03C(2) Proportioning

Field conditions may require adjustments to the proportions within the authorized mix design during construction.

37-3.03C(3) Mixing and Spreading Equipment

37-3.03C(3)(a) General

Reserved

37-3.03C(3)(b) Scratch Course Boxes

Spread the scratch courses with the same type of spreader box used to spread micro-surfacings except use an adjustable steel strike-off device instead of a final strike-off device.

37-3.03C(3)(c) Wheel Path Depression Boxes

Each wheel path depression box must have adjustable strike-off device between 5 and 6 feet wide to regulate depth. The wheel path depression box must also have devices such as hydraulic augers capable of:

1. Moving the mixed material from the rear to the front of the filling chamber
2. Guiding larger aggregate into the deeper section of the wheel path depression
3. Forcing the finer material towards the outer edges of the spreader box

37-3.03C(4) Test Strips

If micro-surfacing placement will require more than 1 day, you must construct a test strip. The test strip must be:

1. From 300 to 450 feet long
2. The same as the full production micro-surfacing
3. On 1 of the application courses specified at an authorized location
4. At the same time of day or night the full production micro-surfacing is to be applied

If multiple application courses are specified, you may construct test strips over 2 days or nights.

The Engineer evaluates the test strip after traffic has used it for 12 hours. If the Engineer determines the mix design or placement procedure is unacceptable, make modifications and construct a new test strip for the Engineer's evaluation.

37-3.03C(5) Placement

37-3.03C(5)(a) General

Reserved

37-3.03C(5)(b) Repair Wheel Path Depressions

If repairing wheel path depressions is shown in plans, fill wheel path depressions and irregularities with micro-surfacing material before spreading micro-surfacing. If the depressions are less than 0.04 foot deep, fill with a scratch course. If the depressions are 0.04 foot deep or more, fill the depressions using a wheel path depression box.

Spread scratch courses by adjusting the steel strike-off of a scratch course box until it is directly in contact with the pavement surface.

Spread micro-surfacings with a wheel path depression box leaving a slight crown at the surface. Use multiple applications to fill depressions more than 0.12 foot deep. Do not apply more than 0.12 foot in a single application.

Allow traffic to compact each filled wheel path depression for a minimum of 12 hours before placing additional micro-surfacings.

37-3.03C(5)(c) Micro-surfacing Pavement Surfaces

The micro-surfacing spread rates must be within the ranges shown in the following table:

| Micro-surfacing type | Application range (lb of dry aggregate/sq yd) |
|-----------------------|--------------------------------------------------|
| Type II | 10–20 |
| Type III ^a | 20–32 |
| Type III ^b | 30–32 |

^aOver asphalt concrete pavement

^bOver concrete pavement and concrete bridge decks

Within 2 hours after placement, micro-surfacings must be set enough to allow traffic without pilot cars. Protect the micro-surfacings from damage until it has set and will not adhere or be picked up by vehicle tires. Micro-surfacings must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

37-3.03D Payment

The payment quantity for micro-surfacing is the weight determined by combining the weights of the aggregate and micro-surfacing emulsion. The payment quantity for micro-surfacing does not include the weights of added water, mineral filler, and additives.

37-3.04 RUBBERIZED AND MODIFIED SLURRY SEALS

Reserved

37-4 FOG SEALS AND FLUSH COATS

37-4.01 GENERAL

37-4.01A General

37-4.01A(1) Summary

Section 37-4.01 includes general specifications for applying fog seals and flush coats.

37-4.01A(2) Definitions

Reserved

37-4.01A(3) Submittals

At least 15 days before use, submit:

1. Sample of asphaltic emulsion in two 1-quart plastic container with lined, sealed lid
2. Asphaltic emulsion information and test data as follows:
 - 2.1. Supplier
 - 2.2. Type/Grade of asphalt emulsion
 - 2.3. Copy of the specified test results for asphaltic emulsion

37-4.01B Materials

Not Used

37-4.01C Construction

37-4.01C(1) General

Reserved

37-4.01C(2) Weather Conditions

Only place a fog seal or flush coat if both the pavement and ambient temperatures are at least 50 degrees F and rising. Do not place a fog seal or flush coat within 24 hours of rain or within 24 hours of forecast rain or freezing temperatures.

37-4.01D Payment

Not Used

37-4.02 FOG SEALS

37-4.02A General

37-4.02A(1) Summary

Section 37-4.02 includes specifications for applying fog seals.

Applying a fog seal includes applying a diluted slow-setting or quick setting asphaltic emulsion.

37-4.02A(2) Definitions

Reserved

37-4.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic container of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-4.02A(4) Quality Assurance

37-4.02A(4)(a) General

Reserved

37-4.02A(4)(b) Quality Control

37-4.02A(4)(b)(i) General

Reserved

37-4.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take asphalt emulsion sample in two 1-quart plastic container with lined, sealed lid.

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

| Quality characteristic | Test Method | Minimum sampling and testing frequency | Sampling location |
|----------------------------------------------------------|-------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 25 °C (Saybolt Furl seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Distributor truck |
| Sieve Test (%) | | | |
| Storage stability, 1 day (%) | | | |
| Residue by distillation (%) | | | |
| Particle charge ^a | | | |
| Tests on Residue from Distillation Test: | | | |
| Penetration, 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Distributor truck |
| Ductility | AASHTO T 51 | | |
| Solubility in trichloroethylene | AASHTO T 44 | | |

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-4.02A(4)(b)(iii) Asphaltic Emulsion Spread Rates

For fog seals, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Fog Seal Quality Control Requirements

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|--------------------------------------------|---------------------|----------------------------------------|----------------------|
| Asphaltic emulsion spread rate (gal/sq yd) | California Test 339 | 2 per day | Pavement surface |

37-4.02A(4)(c) Department Acceptance

Fog seal acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits
 - 1.2. Flushing consisting of the occurrence of a film of asphaltic material on the surface
 - 1.4. Streaking consisting of alternating longitudinal bands of asphaltic emulsion approximately parallel with the lane line
2. The Department's sampling and testing for compliance with the requirements for the quality characteristics specified in section 94 for asphaltic emulsion
3. Department's sampling and testing for compliance with the requirements for fog seal shown in the following table:

Fog Seal Acceptance Criteria

| Quality Characteristic | Test Method | Requirement |
|--------------------------------------------|---------------------|-------------|
| Asphaltic emulsion spread rate (gal/sq yd) | California Test 339 | TV ± 10% |

37-4.02B Materials

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

37-4.02C Construction

Apply asphaltic emulsions for fog seals at a residual asphalt rate from 0.02 to 0.06 gal/sq yd.

If additional water is added to the asphaltic emulsions, the resultant mixture must not be more than 1 part asphaltic emulsion to 1 part water. You determine the dilution rate.

If the fog seals become tacky, sprinkle water as required.

If fog seals and chip seals are on the same project, the joint between the seal coats must be neat and uniform.

37-4.02D Payment

The Department does not adjust the unit price for an increase or decrease in the asphaltic emulsion quantity.

37-4.03 FLUSH COATS

37-4.03A General

37-4.03A(1) Summary

Section 37-4.03 includes specifications for applying flush coats.

Applying a flush coat includes applying a fog seal coat followed by sand.

37-4.03A(2) Definitions

Reserved

37-4.03A(3) Submittals

At least 15 days before use, submit:

1. Proposed target X values for sand gradation.
2. Gradation test results for sand

Submit quality control test results for sand gradation within 2 business days of sampling.

37-4.03A(4) Quality Assurance

37-4.03A(4)(a) General

Reserved

37-4.03A(4)(b) Quality Control

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Sand Quality Control

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|---------------------------------|---------------------|----------------------------------------|-------------------------|
| Gradation (% passing by weight) | California Test 202 | 1 per day | See California Test 125 |

37-4.03A(4)(c) Department Acceptance

Flush coat acceptance is based on fog seal acceptance and the following:

1. Visual inspection for uniform application of sand.
2. Sand acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Sand Gradation Acceptance Criteria

| Quality characteristic | Test method | Requirement |
|---------------------------------|---------------------|-------------|
| Gradation (% passing by weight) | California Test 202 | |
| Sieve size: | | |
| 3/8" | | 100 |
| No. 4 | | 93–100 |
| No. 8 | | 61–99 |
| No. 16 | | X ± 13 |
| No. 30 | | X ± 12 |
| No. 50 | | X ± 9 |
| No.100 | | 1–15 |
| No. 200 | 0–10 | |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

37-4.03B Material

37-4.03B(1) General

Reserved

37-4.03B(2) Sand

Sand must be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.

Sand for a flush coat must comply with the gradations shown in the following table:

Sand Gradation

| Quality characteristic | Test method | Requirement |
|---------------------------------|---------------------|-------------|
| Gradation (% passing by weight) | California Test 202 | |
| Sieve size: | | |
| 3/8" | | 100 |
| No. 4 | | 93–100 |
| No. 8 | | 61–99 |
| No. 16 | | X ± 13 |
| No. 30 | | X ± 12 |
| No. 50 | | X ± 9 |
| No.100 | | 1–15 |
| No. 200 | 0–10 | |

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

Fine aggregate sizes must be distributed such that the difference between the total percentage passing the No. 16 and No. 30 sieves is from 10 to 40, and the difference between the percentage passing the No. 30 and No. 50 sieves is from 10 to 40.

37-4.03C Construction

37-4.03C(1) General

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after applying asphaltic emulsions.

Spread sand aggregate with a mechanical device that spreads sand at a uniform rate over the full width of a traffic lane in a single application. Spread sand at a rate from 2 to 6 lb/sq yd. You determine the application rates for sand and the Engineer authorizes the application rate.

37-4.03C(2) Sweeping

Sweep loose sand material remaining on the surface 24 hours after application.

37-4.03D Payment

The Department does not adjust the unit price for an increase or decrease in the sand cover (seal) quantity.

37-5 PARKING AREA SEALS

37-5.01 GENERAL

37-5.01A Summary

Section 37-5 includes specifications for applying parking area seals. Sealing a parking area consists of spreading a mixture of asphaltic emulsion, aggregate, polymer, and water.

37-5.01B Definitions

Reserved

37-5.01C Submittals

At least 15 days before starting placement, submit a 20 lb sample of the aggregate to be used.

At least 10 days before starting placement, submit:

1. Name of the authorized laboratory to perform testing and mix design.
2. Laboratory report of test results and a proposed mix design. The report and mix design must include the specific materials to be used and show a comparison of test results and specifications. The mix design report must include the quantity of water allowed to be added at the job site. The authorized laboratory performing the tests must sign the original laboratory report and mix design.
3. Manufacturer's data for oil seal primer and polymer.

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you request substitute materials, submit a new laboratory report and mix design at least 10 days before starting placement.

Submit a certificate of compliance for the parking area seal material.

Immediately after sampling, submit two 1-quart plastic containers of parking area seal taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

37-5.01D Quality Assurance

37-5.01D(1) General

Reserved

37-5.01D(2) Quality Control

37-5.01D(2)(a) General

Reserved

37-5.01D(2)(b) Asphaltic Emulsions

For an asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

| Quality characteristic | Test Method | Minimum sampling and testing frequency | Sampling location |
|-----------------------------------------------------------|-------------|----------------------------------------|-------------------|
| Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds) | AASHTO T 59 | Minimum 1 per day per delivery truck | Distributor truck |
| Sieve Test (%) | | | |
| Storage stability, 1 day (%) | | | |
| Residue by distillation (%) | | | |
| Particle charge ^a | | | |
| Tests on Residue from Distillation Test | | | |
| Penetration, 25 °C | AASHTO T 49 | Minimum 1 per day per delivery truck | Distributor truck |
| Ductility | AASHTO T 51 | | |
| Solubility in trichloroethylene | AASHTO T 44 | | |

^aIf the result of the particle char is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-5.01D(2)(c) Sand

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Sand Quality Control

| Quality characteristic | Test method | Minimum sampling and testing frequency | Location of sampling |
|---------------------------------|---------------------|----------------------------------------|-------------------------|
| Gradation (% passing by weight) | California Test 202 | One per project | See California Test 125 |

37-5.01D(2)(d) Parking Area Seals

For a parking area seal, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

Parking Area Seal Requirements

| Quality characteristic | Test method | Frequency |
|----------------------------------------------|-------------------------|-----------------|
| Mass per liter (kg) | ASTM D244 | One per project |
| Cone penetration (mm) | California Test 413 | |
| Nonvolatile (%) | ASTM D2042 ^a | |
| Nonvolatile soluble in trichloroethylene (%) | | |
| Wet track abrasion (g/m ²) | ASTM D3910 | |
| Dried film color | -- | |
| Viscosity (KU) ^b | ASTM D562 | |

^aWeigh 10 g of homogenous material into a previously tarred, small can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

37-5.01D(3) Department Acceptance

Parking area seal acceptance is based on:

1. Visual inspection for:
 - 1.1. Uniform surface texture throughout the work limits
 - 1.2. Marks in the surface:

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Project No. 3605
 March 5, 2019

County of El Dorado
Revised Standard Specifications
 AA-84

- 1.2.1. Up to 4 marks in the completed parking area seal that are up to 1 inch wide and up to 6 inches long per 1,000 square feet of parking area seal placed.
- 1.2.2. No marks in the completed parking area seal surface that are over 1 inch wide or 6 inches long.
- 1.2. Raveling consisting of the separation of the aggregate from the asphaltic emulsion
- 1.3. Bleeding consisting of the occurrence of a film of asphaltic material on the surface of the parking area seal
- 1.4. Delaminating of the parking area seal from the existing pavement
- 1.5. Rutting or wash-boarding
- 2. The Department's sampling and testing of aggregate for compliance with 100 percent passing no. 16 sieve under California Test 202
- 3. The Department's sampling and testing for compliance with the requirements shown in the following table:

Parking Area Seal Acceptance Criteria

| Quality characteristic | Test method | Requirement |
|----------------------------------------------|-------------------------|-------------|
| Mass per liter (min, kg) | ASTM D244 | 1.1 |
| Cone penetration (mm) | California Test 413 | 340–700 |
| Nonvolatile (min, %) | ASTM D2042 ^a | 50 |
| Nonvolatile soluble in trichloroethylene (%) | | 10–35 |
| Wet track abrasion (max, g/m ²) | ASTM D3910 | 380 |
| Dried film color | -- | Black |
| Viscosity (min, KU) ^b | ASTM D562 | 75 |

^aWeigh 10 g of homogenous material into a previously tared, small ointment can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

37-5.02 MATERIALS

37-5.02A General

Aggregate must be clean, hard, durable, uncoated, and free from organic and deleterious substances. One hundred percent of the aggregate must pass the no. 16 sieve.

Asphaltic emulsion must be either Grade SS1h or CSS1h, except the values for penetration at 25 degrees C for tests on residue from distillation must be from 20 to 60.

Polymer must be either neoprene, ethylene vinyl acetate, or a blend of butadiene and styrene.

Oil seal primer must be a quick-drying emulsion with admixtures. Oil seal primer must be manufactured to isolate the parking area seal from pavement with residual oils, petroleum grease, and spilled gasoline.

Crack sealant must comply with section 37-6.

Water must be potable and not separate from the emulsion before the material is placed.

37-5.02B Mix Design

The proposed mix design for a parking area seal must comply with the requirements shown in the following table:

Parking Area Seal Mix Design Requirements

| Quality characteristic | Test method | Requirement |
|----------------------------------------------|-------------------------|-------------|
| Mass per liter (min, kg) | ASTM D244 | 1.1 |
| Cone penetration (mm) | California Test 413 | 340–700 |
| Nonvolatile (min, %) | ASTM D2042 ^a | 50 |
| Nonvolatile soluble in trichloroethylene (%) | | 10–35 |
| Wet track abrasion (max, g/m ²) | ASTM D3910 | 380 |
| Dried film color | -- | Black |
| Viscosity (min, KU) ^b | ASTM D562 | 75 |

^aWeigh 10 g of homogenous material into a previously tarred, small ointment can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

A parking area seal must contain a minimum of 2 percent polymer by volume of undiluted asphaltic emulsion.

37-5.02C Proportioning

Parking area seal ingredients must be mixed at a central plant. The plant must include mechanical or electronic controls that consistently proportion the ingredients. Mix an asphaltic emulsion with the other ingredients mechanically.

Store the parking area seal in a tank equipped with mixing or agitation devices. Keep stored materials thoroughly mixed. Protect stored materials from freezing conditions.

37-5.03 CONSTRUCTION

37-5.03A General

Request that the Engineer shut off the irrigation control system at least 5 days before placing the seal. Do not water plants adjacent to the seal at least 24 hours before and after the seal coat placement.

37-5.03B Surface Preparations

If cracks in the existing pavement are from 1/4 to 1 inch wide, treat the cracks under section 37-6. Do not place the parking area seals until the Engineer determines that the crack treatments are cured.

If cracks in the existing pavement are greater than 1 inch wide, the Engineer orders the repair. This work is change order work.

After any crack treatment and before placing parking area seals, clean the pavement surface, including removal of oil and grease spots. Do not use solvents.

If cleaning the pavement with detergents, thoroughly rinse with water. Allow all water to dry before placing parking area seals.

You must seal oil and grease spots that remain after cleaning. Use an oil seal primer and comply with the manufacturer's instructions.

If the existing pavement has oil and grease spots that do not come clean and sealing is insufficient, the Engineer orders the repair of the pavement. This work is change order work.

Before placing the parking area seals, dampen the pavement surface using a distributor truck. Place the seal on the damp pavement but do not place it with standing water on the pavement.

37-5.03C Placement

If adding water at the job site based on the manufacturer's instructions for consistency and spreadability, do not exceed 15 percent by volume of undiluted asphaltic emulsion.

Place the parking area seals in 1 or more application. The seals must be uniform and smooth, free of ridges or uncoated areas.

If placing in multiple applications, allow the last application to thoroughly dry before the subsequent application.

Do not allow traffic on the parking area seals for at least 24 hours after placement.

Do not stripe over the parking area seals until it is dry.

37-5.04 PAYMENT

The payment quantity for parking area seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion. The payment quantity for parking area seal does not include the added water and set-control additive.

37-6 CRACK TREATMENTS

37-6.01 GENERAL

37-6.01A Summary

Section 37-6 includes specifications for treating cracks in asphalt concrete pavement.

37-6.01B Definitions

Reserved

37-6.01C Submittals

If your selected crack treatment material is on the Authorized Material List for flexible pavement crack treatment material, submit a certificate of compliance including:

1. Manufacturer's name
2. Production location
3. Brand or trade name
4. Designation
5. Batch or lot number
6. Crack treatment material type
7. Contractor or subcontractor name
8. Contract number
9. Lot size
10. Shipment date
11. Manufacturer's signature

If your selected crack treatment material is not on the Authorized Material List for flexible pavement crack treatment material, submit a sample and test results from each batch or lot 20 days before use. Testing must be performed by an authorized laboratory and test results must show compliance with the specifications. Test reports must include the information specified for the certificate of compliance submittal. Each hot-applied crack treatment material sample must be a minimum of 3 lb and submitted in a silicone release container. Each cold-applied crack treatment material sample must be a minimum of 2 quarts and submitted in a plastic container.

At least 10 days before the start of work, submit sand gradation test results under California Test 202.

Submit the following with each delivery of crack treatment material to the job site:

1. Manufacturer's heating and application instructions
2. Manufacturer's SDS
3. Name of the manufacturer's recommended detackifying agent

37-6.01D Quality Assurance

37-6.01D(1) General

Hot-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect two 3-pounds-minimum samples of crack treatment material from the dispensing wand into silicone release boxes.

Cold-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect 2 samples of crack treatment material from the dispensing wand into 1-quart containers.

37-6.01D(2) Quality Control

Reserved

37-6.01D(3) Department Acceptance

Crack treatment acceptance is based on:

1. Visual inspection for uniform filling of cracks throughout the work limits including:
 - 1.2. Crack treatment is not more than a 1/4 inch below the specified level
 - 1.3. Sealant failures
 - 1.4. Crack re-opening
 - 1.5. Crack overbanding is less than 3 inches wide
2. The Department's sampling and testing for compliance with the requirements shown in the following table:

Crack Treatment Acceptance Criteria

| Quality characteristic ^a | Test method ^b | Requirement | | | | |
|-------------------------------------|--------------------------|-------------|--------|--------|--------|--------|
| | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 |
| Softening point (min, °C) | ASTM D36 | 102 | 96 | 90 | 84 | 84 |
| Cone penetration at 77 °F (max) | ASTM D5329 | 35 | 40 | 50 | 70 | 90 |
| Resilience at 77 °F, unaged (%) | ASTM D5329 | 20–60 | 25–65 | 30–70 | 35–75 | 40–80 |
| Flexibility (°C) ^c | ASTM D3111 | 0 | 0 | 0 | -11 | -28 |
| Tensile adhesion (min, %) | ASTM D5329 | 300 | 400 | 400 | 500 | 500 |
| Specific gravity (max) | ASTM D70 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |
| Asphalt compatibility | ASTM D5329 | Pass | Pass | Pass | Pass | Pass |
| Sieve test (% passing) | See note d | 100 | 100 | 100 | 100 | 100 |

^aCold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specified.

^bExcept for viscosity, cure each specimen at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 10 percent for 24 ± 2 hours before testing.

^cFor the flexibility test, the specimen size must be 6.4 ± 0.2 mm thick by 25 ± 0.2 mm wide by 150 ± 0.5 mm long. The test mandrel diameter must be 6.4 ± 0.2 mm. The bend arc must be 180 degrees. The bend rate must be 2 ± 1 seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

^dFor hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

37-6.02 MATERIALS

37-6.02A General

Reserved

37-6.02B Crack Treatment Material

A crack treatment material must comply with the requirements shown in the following table:

Crack Treatment Material

| Quality characteristic ^a | Test method ^b | Requirement | | | | |
|-------------------------------------|--------------------------|-------------|--------|--------|--------|--------|
| | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 |
| Softening point (min, °C) | ASTM D36 | 102 | 96 | 90 | 84 | 84 |
| Cone penetration at 77 °F (max) | ASTM D5329 | 35 | 40 | 50 | 70 | 90 |
| Resilience at 77 °F, unaged (%) | ASTM D5329 | 20–60 | 25–65 | 30–70 | 35–75 | 40–80 |
| Flexibility (°C) ^c | ASTM D3111 | 0 | 0 | 0 | -11 | -28 |
| Tensile adhesion (min, %) | ASTM D5329 | 300 | 400 | 400 | 500 | 500 |
| Specific gravity (max) | ASTM D70 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |
| Asphalt compatibility | ASTM D5329 | Pass | Pass | Pass | Pass | Pass |
| Sieve test (% passing) | See note d | 100 | 100 | 100 | 100 | 100 |

^aCold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specifications.

^bExcept for viscosity, cure each specimen at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 10 percent for 24 ± 2 hours before testing.

^cFor the flexibility test, the specimen size must be 6.4 ± 0.2 mm thick by 25 ± 0.2 mm wide by 150 ± 0.5 mm long. The test mandrel diameter must be 6.4 ± 0.2 mm. The bend arc must be 180 degrees. The bend rate must be 2 ± 1 seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

^dFor hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

A crack treatment material must be delivered to the job site with the information listed below. If crack treatment material is delivered to the job site in containers, each container must be marked with the following information.

1. Manufacturer's name
2. Production location
3. Brand or trade name
4. Designation
5. Crack treatment trade name
6. Batch or lot number
7. Maximum heating temperature
8. Expiration date for cold application only

Hot-applied crack treatment must be delivered to the job site premixed in cardboard containers with meltable inclusion liners or in a fully meltable package.

Cold-applied crack treatment must have a minimum shelf life of 3 months from the date of manufacture.

37-6.02C Sand

Sand applied to tacky crack treatment material must be clean, free of clay, and comply with the gradation shown in the following table:

Sand Gradation

| Quality characteristic | Test method | Requirement |
|---------------------------------|---------------------|-------------|
| Gradation (% passing by weight) | California Test 202 | |
| Sieve size: | | |
| No. 4 | | 100 |
| No. 50 | | 0–30 |
| No. 200 | | 0–5 |

Add between the 3rd and 4th paragraphs of section 39-2.01A(1):

04-15-16

For HMA that uses asphalt binder containing crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of the project.

Add to the table in the 4th paragraph of section 39-2.01A(1):

01-15-16

| | |
|------------------------|--------------------|
| Asphalt Institute MS-2 | 7th edition (2015) |
|------------------------|--------------------|

Add to item 8 in the 4th paragraph of section 39-2.01A(3)(b)(i):

07-15-16

, except lime supplier and source

Replace the headings and paragraphs of section 39-2.01A(3)(i) with:

01-15-16

39-2.01A(3)(i) Reserved

Replace the 2nd sentence in the 3rd paragraph of section 39-2.01A(4)(b) with:

01-15-16

Submit 3 parts and keep 1 part.

Add between *single* and *test* in the 7th paragraph of section 39-2.01A(4)(i)(i):

07-15-16

aggregate or HMA

Replace the 1st paragraph of section 39-2.01B(2)(b) with:

07-15-16

If the proposed JMF indicates that the aggregate is being treated with dry lime or lime slurry with marination, or the HMA with liquid antistrip, then testing the untreated aggregate under AASHTO T 283 and AASHTO T 324 is not required.

If HMA treatment is required or being used by the Contractor, determine the plasticity index of the aggregate blend under California Test 204.

Add between *aggregate* and *with dry lime* in the 3rd and 4th paragraphs of section 39-2.01B(2)(b):

07-15-16

blend

Replace the 9th through 11th paragraphs of section 39-2.01B(8)(a) with:

07-15-16

HMA must be produced at the temperatures shown in the following table:

HMA Production Temperatures

| HMA compaction | Temperature (°F) |
|--------------------------------|--------------------|
| HMA | |
| Density based Method | ≤ 325 305–325 |
| HMA with WMA technology | |
| Density based Method | 240–325 260–325 |

04-15-16

Delete the 1st paragraph of section 39-2.01B(11).

Add after the 2nd paragraph of section 39-2.01B(11):

04-15-16

For miscellaneous areas and dikes:

1. Choose the aggregate gradation from:
 - 1.1. 3/8-inch Type A HMA aggregate gradation
 - 1.2. 1/2-inch Type A HMA aggregate gradation
 - 1.3. 1/2-inch dike mix aggregate gradation
2. Choose asphalt binder Grade PG 64-10, PG 64-16 or PG 70-10.
3. Minimum asphalt binder content must be:
 - 3.1. 6.40 percent for 3/8-inch Type A HMA aggregate gradation
 - 3.2. 5.70 percent for 1/2-inch Type A HMA aggregate gradation
 - 3.3. 6.40 percent for 1/2-inch dike mix aggregate gradation

If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content.

Aggregate gradation for 1/2-inch dike mix must be within the TV limits for the specified sieve size shown in the following table:

**Aggregate Gradation for 1/2-inch Dike Mix
(Percentage Passing)**

| Sieve size | Target value limit | Allowable tolerance |
|------------|--------------------|---------------------|
| 3/4" | 100 | -- |
| 1/2" | 90–95 | TV ± 5 |
| No. 4 | 70–75 | TV ± 5 |
| No. 8 | 23–25 | TV ± 5 |
| No. 50 | 15–35 | TV ± 5 |
| No. 200 | 7.0–13.0 | TV ± 2.0 |

Replace item 4 in the 2nd paragraph of section 39-2.01C(1) with:

07-15-16

4. For method compaction:
 - 4.1. The temperature of the HMA and the HMA produced with WMA water injection technology in the windrow does not fall below 260 degrees F
 - 4.2. The temperature of the HMA produced using WMA additive technology in the windrow does not fall below 250 degrees F

Delete item 3 in the 8th paragraph of section 39-2.01C(1).

07-15-16

Replace 39-2.01A(3)(m)(iv) in the 6th paragraph of section 39-2.01C(3)(e) with:

36-3.01C(3)

01-15-16

Replace 2.06 in the 4th paragraph of section 39-2.01C(3)(f) with:

2.05

07-15-16

Add to the end of section 39-2.01C(15)(b):

The compacted lift thickness must not exceed 0.25 foot.

07-15-16

Add between *rectangles* and *with* in the 4th paragraph of section 39-2.01C(16):

, half the lane width,

04-15-16

Add between *to* and *the* in item 1 of the 4th paragraph of section 39-2.01C(16):

and along

04-15-16

Delete *coat* in the 5th paragraph of section 39-2.01C(16).

07-15-16

Replace 37 in the 5th paragraph of section 39-2.01C(16) with:

37-4.02

07-15-16

Replace section 39-2.02A(3)(b) with:

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

01-15-16

Add between the 1st and 2nd paragraphs of section 39-2.02C:

If the ambient air temperature is below 60 degrees F, cover the loads in trucks with tarpaulins. If the time for HMA discharge to truck at the HMA plant until transfer to paver's hopper is 90 minutes or greater and if the ambient air temperature is below 70 degrees F, cover the loads in trucks with tarpaulins, unless the time from discharging to the truck until transfer to the paver's hopper or the pavement surface is less than

07-15-16

30 minutes. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or the pavement surface.

Replace the table in the 2nd paragraph of section 39-2.02C with:

07-15-16

Minimum Ambient Air and Surface Temperatures

| Lift thickness (feet) | Ambient air (°F) | | Surface (°F) | |
|------------------------------------------------------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | Unmodified asphalt binder | Modified asphalt binder | Unmodified asphalt binder | Modified asphalt binder |
| Type A HMA and Type A HMA produced with WMA water injection technology | | | | |
| <0.15 | 55 | 50 | 60 | 55 |
| ≥0.15 | 45 | 45 | 50 | 50 |
| Type A HMA produced with WMA additive technology | | | | |
| <0.15 | 45 | 45 | 50 | 45 |
| ≥0.15 | 40 | 40 | 40 | 40 |

Delete the 3rd paragraph of section 39-2.02C.

07-15-16

Add between *HMA* and *placed* in the 1st sentence of the 4th paragraph of section 39-2.02C:

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and Type A HMA produced with WMA water injection technology

Add between the 4th and the 5th paragraphs of section 39-2.02C:

07-15-16

For Type A HMA produced with WMA additive technology placed under method compaction, if the asphalt binder is:

1. Unmodified, complete:
 - 1.1 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
 - 1.2 Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
 - 1.3 Finish compaction before the surface temperature drops below 140 degrees F
 - 1.4 You may continue static rolling below 140 degrees F to remove roller marks.
2. Modified, complete:
 - 2.1 1st coverage of breakdown compaction before the surface temperature drops below 230 degrees F
 - 2.2 Breakdown and intermediate compaction before the surface temperature drops below 170 degrees F
 - 2.3 Finish compaction before the surface temperature drops below 130 degrees F
 - 2.4 You may continue static rolling below 130 degrees F to remove roller marks.

Replace the 2nd paragraph of section 39-2.03A(3)(b) with:

01-15-16

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Project No. 3605
 March 5, 2019

County of El Dorado
Revised Standard Specifications
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Replace the requirement in the row for *Voids in mineral aggregate on plant produced HMA* in the 2nd table in section 39-2.03A(4)(e)(i) with:

18.0-23.0

01-15-16

Add before the 1st paragraph of section 39-2.03A(4)(e)(ii)(C):

CRM used must be on the Authorized Materials List for Crumb Rubber Modifier.

04-15-16

CRM must be a ground or granulated combination of scrap tire crumb rubber and high natural scrap tire crumb rubber, CRM must be 75.0 ± 2.0 percent scrap tire crumb rubber and 25.0 ± 2.0 percent high natural scrap tire crumb rubber by total weight of CRM. Scrap tire crumb rubber and high natural scrap tire crumb rubber must be derived from waste tires described in Pub Res Code § 42703.

Replace the row for *Hamburg wheel track* in the table in section 39-2.03B(2) with:

01-15-16

| | | |
|---------------------------------------------------------------------|-----------------------------------------|--------|
| Hamburg wheel track (min, number of passes at the inflection point) | AASHTO T 324 (Modified) ^d | |
| Binder grade: | | |
| PG 58 | | 10,000 |
| PG 64 | | 12,500 |
| PG 70 | | 15,000 |

Replace *RHMA-G* in the 3rd and 5th paragraphs of section 39-2.03C with:

RHMA-G and RHMA-G produced with WMA water injection technology

07-15-16

Add between the 5th and 6th paragraphs of section 39-2.03C:

For RHMA-G produced with WMA additive technology placed under method compaction:

07-15-16

1. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 260 degrees F
2. Complete breakdown and intermediate compaction before the surface temperature drops below 230 degrees F
3. Complete finish compaction before the surface temperature drops below 180 degrees F
4. You may continue static rolling below 140 degrees F to remove roller marks

Replace the 6th and 7th paragraphs of section 39-2.04C with:

For HMA-O and HMA-O produced with WMA water injection technology:

07-15-16

1. With unmodified asphalt binder:
 - 1.1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.

- 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
- 1.3. Complete all compaction before the surface temperature drops below 200 degrees F.
2. With modified asphalt binder, except asphalt rubber binder:
 - 2.1. Spread and compact only if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F.
 - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
 - 2.3. Complete all compaction before the surface temperature drops below 180 degrees F.

For HMA-O produced with WMA additive technology:

1. With unmodified asphalt binder:
 - 1.1. Spread and compact only if the atmospheric temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F.
 - 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.
 - 1.3. Complete all compaction before the surface temperature drops below 190 degrees F.
2. With modified asphalt binder, except asphalt rubber binder:
 - 2.1. Spread and compact only if the atmospheric temperature is at least 40 degrees F and the surface temperature is at least 40 degrees F.
 - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.
 - 2.3. Complete all compaction before the surface temperature drops below 170 degrees F.

Replace *RHMA-O* and *RHMA-O-HB* in the 8th paragraph of section 39-2.04C with:

07-15-16

RHMA-O and RHMA-O produced with WMA water injection technology, and RHMA-O-HB and RHMA-O-HB produced with WMA water injection technology

Add between the 8th and 9th paragraphs of section 39-2.04C:

07-15-16

For RHMA-O produced with WMA additive technology and RHMA-O-HB produced with WMA additives technology:

1. Spread and compact if the ambient air temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 270 degrees F
3. Complete all compaction before the surface temperature drops below 240 degrees F

Add to the 2nd paragraph of section 39-2.05A(3)(b):

01-15-16

The material transfer vehicle must receive HMA directly from the truck.

Replace *Table 6.1* at each occurrence in the table in section 39-2.05B(2) with:

01-15-16

Table 8.1

Replace the 1st sentence in the 5th paragraph of section 49-1.01D(3) with:

07-15-16

Load test and anchor piles must comply with the specifications for piling as described and Class N steel pipe piling.

Add to the list in 7th paragraph of section 49-1.01D(3):

07-15-16

5. Welds that connect the anchor pile and the anchor pile head must be tested under section 49-2.02A(4)(b)(iii)(C)

Replace the 10th paragraph of section 49-1.01D(3) with:

07-15-16

Furnish labor, materials, tools, equipment, and incidentals as required to assist the Department in the transportation, installation, operation, and removal of Department-furnished steel load test beams, jacks, bearing plates, drills, and other test equipment. This is change order work.

Replace the 7th paragraph of section 49-1.01D(4) with:

07-15-16

Piles to be dynamically monitored must:

1. Have an additional length of 2 times the pile diameter plus 2 feet.
2. Be available to the Department at least 2 business days before driving.
3. Be safely supported at least 6 inches off the ground in a horizontal position on at least 2 support blocks. If requested, rotate the piles on the blocks.
4. Be positioned such that the Department has safe access to the entire pile length and circumference for the installation of anchorages and control marks for monitoring.

Delete *business* in item 6 in the list in the 8th paragraph of section 49-1.01D(4).

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Add to the list in 9th paragraph of section 49-1.01D(4):

07-15-16

3. Cut pile to the specified cut-off elevation after bearing acceptance criteria is provided by the Department

Delete the 3rd paragraph of section 49-1.03.

04-15-16

Delete the 2nd paragraph of section 49-1.04.

04-15-16

Delete the 4th paragraph of section 49-2.01C(5).

01-15-16

Replace item 3 in the list in the 2nd paragraph of section 49-3.01A with:

07-15-16

3. CISS concrete piles

Add between *undisturbed material* and *in a dry* in the 1st paragraph of section 49-3.01C:

07-15-16

, casing, or steel shell

Replace the 2nd and 3rd paragraphs of section 49-3.01C with:

07-15-16

Place and secure reinforcement. Securely block the reinforcement to provide the minimum clearance shown between the reinforcing steel cage and the sides of the drilled hole, casing, or steel shell.

Steel shells, casings, and drilled holes must be clean and free of debris before reinforcement and concrete are placed.

Replace *dewatered* in the 4th paragraphs of section 49-3.01C with:

07-15-16

drilled

Add to section 49-3.02A(1):

07-15-16

Permanent steel casing and driven steel shell must comply with section 49-2.02.

Replace the paragraph of section 49-3.02A(2) with:

07-15-16

dry hole: A drilled hole that requires no work to keep it free of water.

dewatered hole: A drilled hole that:

1. Accumulates no more than 12 inches of water at the bottom during a 1 hour period without any pumping from the hole.
2. Has no more than 3 inches of water at the bottom immediately before placing concrete.
3. Does not require temporary casing to control the groundwater.

Replace item 8 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

07-15-16

8. Drilling plan and sequence
9. Concrete sequence and placement plan
10. If inspection pipes are required, methods for ensuring the inspection pipes remain straight, undamaged, and properly aligned during concrete placement

Replace *1 business day* in the paragraph of section 49-3.02A(3)(d) with:

07-15-16

2 business days

Add to section 49-3.02A(3)(d):

07-15-16

The log must:

1. Show the pile location, tip elevation, cutoff elevation, dates of excavation and concrete placement, total quantity of concrete placed, length and tip elevation of any casing, and details of any hole stabilization method and materials used.
2. Include an 8-1/2 by 11 inch graph of concrete placed versus depth of hole filled as follows:
 - 2.1. Plot the graph continuously throughout concrete placement. Plot the depth of drilled hole filled vertically with the pile tip at the bottom and the quantity of concrete placed horizontally.
 - 2.2. Take readings at each 5 feet of pile depth, and indicate the time of the reading on the graph.

Add after the sentence in the paragraph of section 49-3.02A(3)(e):

07-15-16

Allow 10 days for the review.

Replace the 3rd sentence in the paragraph of section 49-3.02A(3)(f) with:

07-15-16

Allow 10 days for the review and analysis of this report.

Add after *rejected pile* in the 1st sentence in the 1st paragraph of section 49-3.02A(3)(g):

07-15-16

to be mitigated

Delete the 2nd paragraph of section 49-3.02A(3)(g).

07-15-16

Replace item 3 in the list in the 3rd paragraph of section 49-3.02A(3)(g) with:

07-15-16

3. Step by step description of the mitigation work to be performed, including drawings if necessary. If the *ADSC Standard Mitigation Plan* is an acceptable mitigation method, include the most recent version. For the most recent version of the *ADSC Standard Mitigation Plan*, go to:
<http://www.dot.ca.gov/hq/esc/geotech/ft/adscmitplan.htm>

Replace the 2nd sentence in the paragraph of section 49-3.02A(3)(i) with:

07-15-16

Allow 10 days for the review.

Add to section 49-3.02A(3):

07-15-16

49-3.02A(3)(j) Certifications

If synthetic slurry is used, submit as an informational submittal the names and certifications of your employees who are trained and certified by the synthetic slurry manufacturer.

Add after *excavated hole* in the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(c):

07-15-16

lined with plastic

Replace the 1st paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

Section 49-3.02A(4)(d) applies to CIDH concrete piles except for piles (1) less than 24 inches in diameter or (2) constructed in dry or dewatered holes.

Replace *gamma-gamma logging* in the 2nd paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

GGL

Replace the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

After notification by the Engineer of pile acceptance, fill the inspection pipes and cored holes with grout.

Replace *gamma-gamma logging* in section 49-3.02A(4)(d)(ii) with:

07-15-16

GGL

Replace the 3rd and 4th paragraphs of section 49-3.02A(4)(d)(iii) with:

07-15-16

The Department may perform CSL to determine the extent of the anomalies identified by GGL and to further evaluate a rejected pile for the presence of anomalies not identified by GGL. The pile acceptance test report will indicate if the Department intends to perform CSL and when the testing will be performed. Allow the Department 20 additional days for a total of 50 days to perform CSL and to provide supplemental results.

If authorized, you may perform testing on the rejected pile.

Delete the 8th paragraph of section 49-3.02A(4)(d)(iii).

07-15-16

Add to the end of section 49-3.02A(4)(d)(iii):

07-15-16

If the Engineer determines it is not feasible to repair the rejected pile, submit a mitigation plan for replacement or supplementation of the rejected pile.

Add to section 49-3.02A(4):

07-15-16

49-3.02A(4)(e) Certifications

If synthetic slurry is used, your employees who will be providing technical assistance in the slurry activities must be trained and certified by the synthetic slurry manufacturer to show their competency to perform inspection of slurry operations.

Replace section 49-3.02B(4) with:

07-15-16

49-3.02B(4) Reserved

Replace *near* in the 3rd, 4th, and 5th paragraphs of section 49-3.02B(6)(b) with:

07-15-16

within 2 feet of

Replace *twice per shift* in item 2 in the 3rd paragraph of section 49-3.02B(6)(b) with:

07-15-16

every 4 hours

Delete the 7th and 8th paragraphs of section 49-3.02B(6)(b).

07-15-16

Delete the 3rd paragraph of section 49-3.02B(6)(c).

07-15-16

Replace *near* in item 2 in the 4th paragraph of section 49-3.02B(6)(c) with:

07-15-16

within 2 feet of

Replace item 5 in the 4th paragraph of section 49-3.02B(6)(c) with:

07-15-16

5. After final cleaning and immediately before placing concrete.

Replace section 49-3.02B(9) with:

07-15-16

49-3.02B(9) Inspection Pipes

Inspection pipes must be schedule 40 PVC pipe complying with ASTM D1785 with a nominal pipe size of 2 inches.

Watertight PVC couplers complying with ASTM D2466 are allowed to facilitate pipe lengths in excess of those commercially available.

Add to the beginning of section 49-3.02C(1):

07-15-16

Unless otherwise authorized, drilling the hole and placing reinforcement and concrete in the hole must be performed in a continuous operation.

Replace the 5th paragraph of section 49-3.02C(2) with:

07-15-16

If slurry is used during excavation, maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

Replace the 1st sentence in the 9th paragraph of section 49-3.02C(2) with:

07-15-16

Remove water that has infiltrated the dewatered hole before placing concrete, as required for dewatered hole.

Replace the 1st sentence in the 10th paragraph of section 49-3.02C(2) with:

07-15-16

If authorized, to control caving or water seepage, you may enlarge portions of the hole, backfill the hole with slurry cement backfill, concrete, or other material, and redrill the hole to the diameter shown.

Replace the 4th paragraph of section 49-3.02C(3) with:

07-15-16

Remove the temporary casing during concrete placement. Maintain the concrete in the casing at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing, to prevent displacement of the concrete by material from outside the casing.

Replace the 5th paragraph of section 49-3.02C(4) with:

07-15-16

For a single CIDH concrete pile supporting a column:

1. If the pile and the column share the same reinforcing cage diameter, this cage must be accurately placed as shown
2. If the pile reinforcing cage is larger in diameter than the column cage:
 - 2.1. Maintain a clear horizontal distance of at least 3.5 inches between the two cages, if the concrete is placed under dry conditions
 - 2.2. Maintain a clear horizontal distance of at least 5 inches between the two cages if the concrete is placed under slurry
 - 2.3. The offset between the centerlines of the two cages must not exceed 6 inches

Replace the paragraphs in section 49-3.02C(5) with:

07-15-16

For acceptance testing, install and test vertical inspection pipes as follows:

1. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.
2. Cap each inspection pipe at the bottom. Extend the pipe from 3 feet above the pile cutoff to the bottom of the reinforcing cage. Provide a temporary top cap or similar means to keep the pipes clean

before testing. If pile cutoff is below the ground surface or working platform, extend inspection pipes to 3 feet above the ground surface or working platform.

3. If any changes are made to the pile tip, extend the inspection pipes to the bottom of the reinforcing cage.
4. Install inspection pipes in a straight alignment and parallel to the main reinforcement. Securely fasten inspection pipes in place and provide protective measures to prevent misalignment or damage to the inspection pipes during installation of the reinforcement and placement of concrete in the hole. Construct CIDH concrete piles such that the relative distance of inspection pipes to vertical steel reinforcement remains constant.
5. After concrete placement is complete, fill inspection pipes with water to prevent debonding of the pipe.
6. Provide safe access to the tops of the inspection pipes.
7. After placing concrete and before requesting acceptance testing, test each inspection pipe in the Engineer's presence by passing a rigid cylinder through the length of pipe. The rigid cylinder must be 1-1/4-inch diameter by 4.5-foot long, weigh 12 pounds or less, and be able to freely pass down through the entire length of the pipe under its own weight and without the application of force.
8. When performing acceptance testing, inspection pipes must provide a 2-inch-diameter clear opening and be completely clean, unobstructed, and either dry or filled with water as authorized.
9. After acceptance testing is complete, completely fill the inspection pipes with water.

If the rigid cylinder fails to pass through the inspection pipe:

1. Completely fill the inspection pipes in the pile with water immediately.
2. Core a nominal 2-inch-diameter hole through the concrete for the entire length of the pile for each inspection pipe that does not pass the rigid cylinder. Coring must not damage the pile reinforcement.
3. Locate cored holes as close as possible to the inspection pipes they are replacing and no more than 5 inches clear from the reinforcement.

Core holes using a double wall core barrel system with a split tube type inner barrel. Coring with a solid type inner barrel is not allowed.

Coring methods and equipment must provide intact cores for the entire length of the pile.

Photograph and store concrete cores as specified for rock cores in section 49-1.01D(5).

The coring operation must be logged by an engineering geologist or civil engineer licensed in the State and experienced in core logging. Coring logs must comply with the Department's *Soil and Rock Logging, Classification, and Presentation Manual* for rock cores. Coring logs must include core recovery, rock quality designation of the concrete, locations of breaks, and complete descriptions of inclusions and voids encountered during coring.

The Department evaluates the portion of the pile represented by the cored hole based on the submitted coring logs and concrete cores. If the Department determines a pile is anomalous based on the coring logs and concrete cores, the pile is rejected.

Replace item 2 in the list in the 2nd paragraph of section 49-3.02C(7) with:

2. Extend at least 5 feet below the construction joint. If placing casing into rock or a dry hole, the casing must extend at least 2 feet below the construction joint.

07-15-16

Add to the beginning of section 49-3.02C(9):

07-15-16

49-3.02C(9)(a) General

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Project No. 3605
March 5, 2019

County of El Dorado
Revised Standard Specifications
AA-104

Replace the 2nd sentence of the 3rd paragraph of section 49-3.02C(9) with:

04-15-16

Do not vibrate the concrete.

Add after *concrete pump* in the 8th paragraph of section 49-3.02C(9):

07-15-16

and slurry pump

Replace item 3 in the list in the 11th paragraph of section 49-3.02C(9) with:

07-15-16

3. Maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

Replace the 13th paragraph of section 49-3.02C(9) with:

07-15-16

Maintain a log of concrete placement for each drilled hole.

Replace 14th and 15th paragraphs of section 49-3.02C(9) with:

07-15-16

If a temporary casing is used, maintain concrete placed under slurry at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing. The withdrawal of the casing must not cause contamination of the concrete with slurry.

The equivalent hydrostatic pressure inside the casing must be greater than the hydrostatic pressure on the outside of the casing to prevent intrusion of water, slurry, or soil into the column of freshly placed concrete.

Remove scum, laitance, and slurry-contaminated concrete from the top of the pile.

Add to section 49-3.02C(9):

07-15-16

49-3.02C(9)(b) Mineral Slurry

Remove any caked slurry on the sides or bottom of hole before placing reinforcement.

If concrete is not placed immediately after placing reinforcement, the reinforcement must be removed and cleaned of slurry, the sides of the drilled hole must be cleaned of caked slurry, and the reinforcement again placed in the hole for concrete placement.

49-3.02C(9)(c) Synthetic Slurry

A manufacturer's representative must:

1. Provide technical assistance for the use of their material
2. Be at the job site before introduction of the synthetic slurry into the drilled hole
3. Remain at the job site until released by the Engineer

After the manufacturer's representative has been released by the Engineer, your employee certified by the manufacturer must be present during the construction of the pile under slurry.

Replace the heading of section 49-3.03 with:

07-15-16

CAST-IN-STEEL SHELL CONCRETE PILING

Replace the 1st paragraph of section 49-3.03A(1) with:

07-15-16

Section 49-3.03 includes specifications for constructing CISS concrete piles consisting of driven open-ended or closed-ended steel shells filled with reinforcement and concrete.

Add to the end of section 49-3.03A(1):

07-15-16

CISS concrete piles include Class 90 Alternative V and Class 140 Alternative V piles.

Add to section 49-3.03A(3):

01-15-16

Submit a Pile and Driving Data Form under section 49-2.01A(3)(a) if specified in the special provisions.

Replace the paragraph of section 49-3.03D with:

07-15-16

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

Replace section 49-4.03 with:

01-15-16

49-4.03 CONSTRUCTION

49-4.03A General

Reserved

49-4.03B Drilled Holes

Drill holes for steel soldier piles into natural foundation material. Drilled holes must be accurately located, straight, and true.

Furnish and place temporary casings or tremie seals where necessary to control water or to prevent caving of the hole.

Before placing the steel soldier pile, remove loose materials existing at the bottom of the hole after drilling operations have been completed.

Do not allow surface water to enter the hole. Remove all water in the hole before placing concrete.

If temporary casings are used, they must comply with section 49-3.02C(3).

49-4.03C Steel Soldier Piles

Plumb and align the pile before placing concrete backfill and lean concrete backfill. The pile must be at least 2 inches clear of the sides of the hole for the full length of the hole to be filled with concrete backfill and lean concrete backfill. Ream or enlarge holes that do not provide the clearance around steel piles.

Maintain alignment of the pile in the hole while placing backfill material.

Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 180 days of use and after each repair.

50-1.01D(2)(b)(iii) Pretensioning

Each jack used to pretension prestressing steel must be calibrated, equipped with its gauges, by a laboratory on the Authorized Laboratory List within 1 year of use and after each repair.

Calibrate pretensioning jacks:

1. Under ASTM E4 using an authorized laboratory. Certification that the calibration is performed to ASTM accuracy is not required.
2. In the presence of the Engineer. Notify the Engineer at least 2 business days before calibrating the jack.
3. Using 3 test cycles. Average the forces from each test cycle at each increment.
4. To cover the load range used in the work.

Gauges for pretensioning jacks may:

1. Be electronic pressure indicators that display either:
 - 1.1. Pressure in 100 psi increments or less
 - 1.2. Load to 1 percent of the maximum sensor/indicator capacity or 2 percent of the maximum load applied, whichever is smaller
2. Have a dial less than 6 inches in diameter

Gauges displaying pressure must have been calibrated within 1 year of the jack calibration.

Each hydraulic jack used for pretensioning must be equipped with either 2 gauges or 1 gauge and a load cell or you must have a calibrated standby jack with its gauge present on site during stressing.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

51 CONCRETE STRUCTURES

07-15-16

Add to the list in the 2nd paragraph of section 51-1.01A:

- | | |
|--------------------|----------|
| 8. Pile extensions | 04-15-16 |
| 9. Drainage inlets | 07-15-16 |

Add to the list in the 6th paragraph of section 51-1.01A:

- | | |
|--------------------|----------|
| 7. Drainage inlets | 07-15-16 |
|--------------------|----------|

Add to section 51-1.02I:

07-15-16

Metal frames, covers, grates, and other miscellaneous iron and steel used with drainage inlets must comply with section 75-2.

Add to section 51-1.03B:

07-15-16

You may use PC drainage inlets as an alternative to CIP drainage inlets.

Add between the 10th and 11th paragraphs of section 51-1.03C(2)(a):

07-15-16

For drainage inlets, extend the outside forms at least 12 inches below the top of the inlet. You may place concrete against excavated earth below this depth except:

1. You must use full-depth outside forms or other protection when work activities or unstable earth may cause hazardous conditions or contamination of the concrete.
2. You must increase the wall thickness 2 inches if placing concrete against the excavated surface. The interior dimensions must be as shown.

Add to section 51-1.03C(2)(b):

07-15-16

For drainage inlets, remove exterior forms to at least 12 inches below the final ground surface. Exterior forms below this depth may remain if their total thickness is not more than 1 inch.

Add to the list in the 2nd paragraph of section 51-1.03F(2):

07-15-16

4. Interior and top surfaces of drainage inlets

Add to section 51-1.04:

07-15-16

The payment quantity for structural concrete, drainage inlet is the volume determined from the dimensions shown for CIP drainage inlets.

Add to section 51-4.01C(1):

07-15-16

For PC drainage inlets, submit field repair procedures and a patching material test sample before repairs are made. Allow 10 days for the Engineer's review.

Add to section 51-4.01C(2)(a):

07-15-16

For drainage inlets with oval or circular cross sections, submit shop drawings with calculations. Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State. Allow 15 days for the Engineer's review.

Add to section 51-4.01D(3):

07-15-16

The Engineer may reject PC drainage inlets exhibiting any of the following:

1. Cracks more than 1/32 inch wide
2. Nonrepairable honeycombed or spalled areas of more than 6 square inches
3. Noncompliance with reinforcement tolerances or cross sectional area shown
4. Wall, inlet floor, or lid less than minimum thickness

5. Internal dimensions less than dimensions shown by 1 percent or 1/2 inch, whichever is greater
6. Defects affecting performance or structural integrity

Add to section 51-4.02C:

07-15-16

Materials for PC drainage inlets must comply with the following:

1. Preformed flexible joint sealant must be butyl-rubber complying with ASTM C990
2. Resilient connectors must comply with ASTM C923
3. Sand bedding must comply with section 19-3.02F(2)
4. Bonding agents must comply with ASTM C1059/C1059, Type II

Add to section 51-4.02D:

07-15-16

51-4.02D(8) Drainage Inlets

PC units for drainage inlets must be rectangular, round, or oval in cross section, or any combination. Transitions from a rectangular grate opening to a round or oval basin must be made in not less than 8 inches. Provide means for field adjustment to meet final grade, paving, or surfacing.

If oval or circular shape cross-sections are furnished, they must comply with *AASHTO LRFD Bridge Design Specifications, Sixth Edition with California Amendments*.

Wall and slab thicknesses may be less than the dimensions shown by at most 5 percent or 3/16 inch, whichever is greater.

Reinforcement placement must not vary more than 1/2 inch from the positions shown.

Add to section 51-4.03:

07-15-16

51-4.03H Drainage Inlets

Repair PC drainage inlet sections to correct damage from handling or manufacturing imperfections before installation.

Center pipes in openings to provide a uniform gap. Seal gaps between the pipe and the inlet opening with nonshrink grout under the grout manufacturer's instructions. For systems designated as watertight, seal these gaps with resilient connectors.

Match fit keyed joints to ensure uniform alignment of walls and lids. Keys are not required at the inlet floor level if the floor is precast integrally with the inlet wall. Seal keyed joint locations with preformed butyl rubber joint sealant. You may seal the upper lid and wall joint with nonshrink grout.

Clean keyed joint surfaces before installing sealant. Joint surfaces must be free of imperfections that may affect the joint. Use a primer if surface moisture is present. Use a sealant size recommended by the sealant manufacturer. Set joints using sealant to create a uniform bearing surface.

Flat drainage inlet floors must have a field-cast topping layer at least 2 inches thick with a slope of 4:1 (horizontal:vertical) toward the outlet. Use a bonding agent when placing the topping layer. Apply the bonding agent under the manufacturer's instructions.

Replace the 2nd paragraph of section 51-7.01A with:

07-15-16

Minor structures include structures described as minor structures.

Nondestructive Testing for Steel Standards and Poles

| Weld location | Weld type | Minimum required NDT |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Circumferential splices around the perimeter of tubular sections, poles, and arms | CJP groove weld with backing ring | 100% UT or RT |
| Longitudinal seam | CJP or PJP groove weld | Random 25% MT |
| Longitudinal seam within 6 inches of a circumferential splice | CJP groove weld | 100% UT or RT |
| Welds attaching base plates, flange plates, pole plates, or mast arm plates to poles or arm tubes | CJP groove weld with backing ring and reinforcing fillet | t \geq 5/16 inch: 100% UT and 100% MT t < 5/16 inch: 100% MT after root weld pass and final weld pass |
| | External (top) fillet weld for socket-type connections | 100% MT |
| Hand holes and other appurtenances | Fillet and PJP welds | MT full length on random 25% of all standards and poles |

NOTE: t = pole or arm thickness

Nondestructive Testing for Overhead Sign Structures

| Weld location | Weld type | Minimum required NDT |
|------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Base plate to post | CJP groove weld with backing ring and reinforcing fillet | 100% UT and 100% MT |
| Base plate to gusset plate | CJP groove weld | 100% UT |
| Circumferential splices of pipe or tubular sections | CJP groove weld with backing ring | 100% UT or RT |
| Split post filler plate welds | CJP groove weld with backing bar | 100% UT or RT |
| Longitudinal seam weld for pipe posts | CJP groove weld | t < 1/4 inch: 100% MT t ≥ 1/4 inch: 100% UT or RT |
| | PJP groove weld | Random 25% RT |
| Chord angle splice weld | CJP groove weld with backing bar | 100% UT or RT |
| Truss vertical, diagonal, and wind angles to chord angles | Fillet weld | Random 25% MT |
| Upper junction plate to chord (cantilever type truss) | Fillet weld | Random 25% MT |
| Bolted field splice plates (tubular frame type) | CJP groove weld | 100% UT and 100% MT |
| Cross beam connection plates (lightweight extinguishable message sign) | Fillet weld | Random 25% MT |
| Arm connection angles (lightweight extinguishable message sign) | Fillet weld | 100% MT |
| Mast arm to arm plate (lightweight extinguishable message sign) | CJP groove weld with backing ring | t ≥ 5/16 inch: 100% UT and 100% MT t < 5/16 inch: 100% MT after root weld pass and final weld pass |
| Post angle to post (lightweight extinguishable message sign) | Fillet weld | 100% MT |
| Hand holes and other appurtenances | Fillet and PJP welds | MT full length on random 25% of all sign structures |

NOTE: t = pole or arm thickness

56-1.01D(2)(b)(ii) Ultrasonic Testing

For UT of welded joints with any members less than 5/16 inch thick or tubular sections less than 13 inches in diameter, the acceptance and repair criteria must comply with Clause 6.13.3.1 of AWS D1.1.

For UT of other welded joints, the acceptance and repair criteria must comply with Table 6.3 of AWS D1.1 for cyclically loaded nontubular connections.

After galvanization, perform additional inspection for toe cracks along the full length of all CJP groove welds at tube-to-transverse plate connections using UT.

When performing UT, use an authorized procedure under AWS D1.1, Annex S.

56-1.01D(2)(b)(iii) Radiographic Testing

The acceptance criteria for radiographic or real time image testing must comply with AWS D1.1 for tensile stress welds.

56-1.01D(2)(b)(iv) Longitudinal Seam Welds

The Engineer selects the random locations for NDT.

Grind the cover pass smooth at the locations to be tested.

If repairs are required in a portion of a tested weld, perform NDT on the repaired portion and on 25 percent of the untested portions of the weld. If more repairs are required, perform NDT on the entire weld.

56-1.01D(3) Department Acceptance

Reserved

Replace section 56-2.01D(2)(b) with:

07-15-16

Reserved

Replace the 2nd sentence of the 1st paragraph of section 56-2.02F with:

07-15-16

Manufactured pipe posts must comply with one of the following:

Add to the list in the 1st paragraph of section 56-2.02F:

07-15-16

- 4. ASTM A1085, Grade A

Replace the 2nd paragraph of section 56-2.02F with:

07-15-16

You may fabricate pipe posts from structural steel complying with ASTM A36/A36M, ASTM A709/A709M, Grade 36, or ASTM A572/A572M, Grades 42 or 50.

Delete the last sentence in the 1st paragraph of section 56-2.02K(2).

07-15-16

Delete the 3rd paragraph of section 56-2.02K(2).

07-15-16

Replace the 2nd paragraph of section 56-2.02K(4) with:

07-15-16

Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.

Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:

07-15-16

The edges of handholes and other large post and arm openings must be ground smooth.

Replace the heading of section 56-3 with:

07-15-16

56-3 STANDARDS, POLES, PEDESTALS, AND POSTS

Replace the paragraph in section 56-3.01A with:

07-15-16

Section 56-3 includes general specifications for fabricating and installing standards, poles, pedestals, and posts.

Replace section 56-3.01B(2)(b) with:

07-15-16

Standards with handholes must comply with the following:

1. Include a UL-listed lug and 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for non-slip-base standards.
2. Attach a UL-listed lug to the bottom slip base plate with a 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for slip-base standards.

Replace the 1st sentence of the 3rd paragraph of section 56-3.01C(2)(a) with:

07-15-16

After each standard, pole, pedestal, and post is properly positioned, place mortar under the base plate.

Replace the 2nd sentence of the 4th paragraph of section 56-3.01C(2)(a) with:

07-15-16

The top of the foundation at curbs or sidewalks must be finished to curb or sidewalk grade.

Replace the 10th paragraph of section 56-3.01C(2)(a) with:

07-15-16

Except when located on a structure, construct foundations monolithically.

Replace the 13th paragraph of section 56-3.01C(2)(a) with:

07-15-16

Do not erect standards, poles, pedestals, or posts until the concrete foundation has cured for at least 7 days.

Replace the 14th paragraph in section 56-3.01C(2)(a) with:

07-15-16

The Engineer selects either the plumbing or raking technique for standards, poles, pedestals, and posts. Plumb or rake by adjusting the leveling nuts before tightening nuts. Do not use shims or similar devices. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made and each standard, pole, pedestal, and post on the structure is properly positioned, tighten nuts as follows:

1. Tighten leveling nuts and top nuts, following a crisscross pattern, until bearing surfaces of all nuts, washers, and base plates are in firm contact.
2. Use an indelible marker to mark the top nuts and base plate with lines showing relative alignment of the nut to the base plate.

3. Tighten top nuts following a crisscross pattern:
 - 3.1. Additional 1/6 turn for anchor bolts greater than 1-1/2 inches in diameter.
 - 3.2. Additional 1/3 turn for other anchor bolts.
 - 3.3. Tightening tolerance for all top nuts is $\pm 1/8$ turn.

Replace the 1st sentence of the 4th paragraph of section 56-3.01C(2)(b) with:

07-15-16

If shown, use sleeve nuts on Type 1 standards.

Add to section 56-3.01C(2)(b):

07-15-16

Spiral reinforcement must be continuous above the bottom of the anchor bolts. The top termination must be either:

1. 1'-6" lap beyond the end of pitch with a 90-degree hook extending to the opposite side of the cage, or
2. 1'-6" lap beyond the end of pitch with 2 evenly spaced authorized mechanical couplers

Replace the 1st sentence of the paragraph in section 56-3.02A(4)(b) with:

07-15-16

For cast slip bases for standards and poles with shaft lengths of 15 feet or more, perform RT on 1 casting from each lot of a maximum of 50 castings under ASTM E94.

Replace the 2nd paragraph of section 56-3.02B(1) with:

07-15-16

Material for push button posts, pedestrian barricades, and guard posts must comply with ASTM A53/A53M or ASTM A500/A500M.

Add to section 56-3.02B(1):

07-15-16

Steel pipe standards and mast arms must be hot dip galvanized after manufacturing. Remove spikes from galvanized surfaces.

Replace the 2nd paragraph of section 56-3.02B(2) with:

07-15-16

HS anchor bolts, nuts, and washers must comply with section 55-1.02D(1) and the following:

1. Bolt threads must be rolled
2. Hardness of HS anchor bolts must not exceed 34 HRC when tested under ASTM F606
3. Galvanization must be by mechanical deposition
4. Nuts must be heavy-hex type
5. Each lot of nuts must be proof load tested

Replace the 2nd sentence of the 9th paragraph of section 56-3.02B(2) with:

07-15-16

During manufacturing, properly locate the position of the luminaire arm on the arm plate to avoid interference with the cap screw heads.

Add to section 56-3.02B(3)(a):

07-15-16

Steel having a nominal thickness greater than 2 inches that is used for tube-to-transverse plate connections must have a minimum CVN impact value of 20 ft-lb at 20 degrees F when tested under ASTM E23.

Add to section 56-3.02B(3)(c):

07-15-16

The length of telescopic slip-fit splices must be at least 1.5 times the inside diameter of the exposed end of the female section.

For welds connecting reinforced handholes or box-type pole plate connections to a tubular member, the start and stop points must be at points located on a longitudinal axis of symmetry of the tube coinciding with the axis of symmetry of the hand hole or pole plate.

Replace the table in the 1st paragraph of section 56-3.02C with:

07-15-16

| Slip Base Bolt Tightening Requirements | |
|-----------------------------------------------|----------------|
| Standard type | Torque (ft-lb) |
| 15-SB | 150 |
| 15-SBF | 150 |
| 30 | 150 |
| 31 | 200 |

Replace the 1st sentence of the 2nd paragraph of section 56-3.02C with:

07-15-16

Bolted connections attaching signal or luminaire arms to standards, poles, and posts are considered slip critical.

Add to section 56-3.06B:

07-15-16

Manufacture the mast arm from standard pipe, free from burrs. Each mast arm must have an insulated wire inlet and wood pole mounting brackets for the mast arm and tie-rod cross arm. Manufacture tie rod from structural steel and pipe.

Delete the 2nd paragraph of section 56-3.06C.

07-15-16

Replace the 1st sentence of the 3rd paragraph of section 56-3.06C with:

07-15-16

Mount the mast arm for luminaires to provide a 34-foot mounting height for a 165 W LED luminaire and a 40-foot mounting height for a 235 W LED luminaire.

64-3.01C Submittals

If an or equal slotted plastic pipe is being considered, it must be submitted 30 days before installation for approval.

If RSC is used for concrete backfill for slotted plastic pipe, submit the concrete mix design and test data from an authorized laboratory 10 days before excavating the pipe trench. The laboratory must specify the cure time required for the concrete mix to attain 2,000 psi compressive strength when tested under California Test 521.

Heel-resistant grates if specified must be submitted 30 days before installation for approval. Anchorage details must be included in the submittal.

64-3.01D Quality Assurance

Reserved

64-3.02 MATERIALS

64-3.02A General

Not Used

64-3.02B Slotted Plastic Pipes

Slotted plastic pipe must be one of the following or equal:

| Slotted Plastic Pipe | |
|-----------------------------|-----------------|
| 12" diameter | 18" diameter |
| Zurn Z888-12 | Zurn Z888-18 |
| ACO Qmax 350 | ACO Qmax 365 |
| ADS Duraslot-12 | ADS Duraslot-18 |

64-3.02C Concrete Backfill

Concrete for concrete backfill for slotted plastic pipe must comply with the specifications for minor concrete. You may use RSC instead of minor concrete for concrete backfill.

If RSC is used for concrete backfill, the RSC must:

1. Contain at least 590 pounds of cementitious material per cubic yard
2. Comply with section 90-3.02A, except section 90-1 does not apply
3. Comply with section 90-2

64-3.02D Heel-Resistant Grates

Heel-resistant grate must:

1. Be designed to carry traffic loadings
2. Comply with ADA requirements
3. Be constructed of steel or cast iron
4. Be provided by the same manufacturer of the slotted plastic pipe
5. Comply with the manufacturer's instructions

64-3.02E Bar Reinforcement

Bar reinforcement must comply with ASTM A615/A615M, Grade 60 or ASTM A706/A706M, Grade 60.

64-3.02F Miscellaneous Metal

Ductile iron, nuts, bolts, and washers must comply with section 75.

64-3.02G Grout

Grout must be non-shrink grout complying with ASTM C1107/C1107M.

64-3.02H Curing Compound

Non-pigmented curing compound must comply with ASTM C309, Type 1, Class B.

64-3.02I End Caps

End cap must:

1. Be provided by the same manufacturer of the slotted plastic pipe
2. Prevent concrete backfill from entering the pipe

64-3.03 CONSTRUCTION

64-3.03A General

Cover the grate slots with heavy-duty tape or other authorized covering during paving and concrete backfilling activities to prevent material from entering the slots.

64-3.03B Preparation

Pave adjacent traffic lanes before installing slotted plastic pipes.

Excavation must comply with section 19-3.

64-3.03C Installation

Lay and join slotted plastic pipes under the pipe manufacturer's instructions.

Lay pipes to line and grade with sections closely jointed and adequately secured to prevent separation during placement of the concrete backfill. If the pipes do not have a positive interlocking mechanism like a slot and tongue connection, secure the sections together with nuts, bolts, and washers before backfilling.

The top of slotted plastic pipes must not extend above the completed surface. Position the pipes so that the concrete backfill is flush with the surrounding grade and above the top of the grate from 1/8 to 1/4 inch.

Place channels with the male and female ends facing each other.

Place lateral support bar reinforcement on both sides of the grate slots. The support bar reinforcement must run the full length of the slots.

Anchor heel-resistant grates to the concrete backfill under the manufacturer's instructions.

64-3.03D Concrete Backfill

Wherever minor concrete is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill within 7 days of placement.

Wherever RSC is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill before the required cure time of 2,000 psi is achieved.

Place concrete backfill where shown.

Consolidate the concrete backfill with high-frequency internal vibrators.

Texture the concrete backfill surface with a broom or burlap drag to produce a durable skid-resistant surface.

Apply a non-pigmented curing compound to the exposed concrete backfill surface whenever the atmospheric temperature is 90 degrees F or greater after placement.

Rock Gradation

| Nominal RSP class by median particle diameter ^b | | Nominal median particle weight W ₅₀ ^{c,d} | d ₁₅ ^c (inches) | | d ₅₀ ^c (inches) | | d ₁₀₀ ^c (inches) | Placement |
|------------------------------------------------------------|-------------------|---------------------------------------------------------------|---------------------------------------|------|---------------------------------------|------|----------------------------------------|-----------|
| Class ^a | Diameter (inches) | | Min | Max | Min | Max | Max | Method |
| I | 6 | 20 lb | 3.7 | 5.2 | 5.7 | 6.9 | 12.0 | B |
| II | 9 | 60 lb | 5.5 | 7.8 | 8.5 | 10.5 | 18.0 | B |
| III | 12 | 150 lb | 7.3 | 10.5 | 11.5 | 14.0 | 24.0 | B |
| IV | 15 | 300 lb | 9.2 | 13.0 | 14.5 | 17.5 | 30.0 | B |
| V | 18 | 1/4 ton | 11.0 | 15.5 | 17.0 | 20.5 | 36.0 | B |
| VI | 21 | 3/8 ton | 13.0 | 18.5 | 20.0 | 24.0 | 42.0 | A or B |
| VII | 24 | 1/2 ton | 14.5 | 21.0 | 23.0 | 27.5 | 48.0 | A or B |
| VIII | 30 | 1 ton | 18.5 | 26.0 | 28.5 | 34.5 | 48.0 | A or B |
| IX | 36 | 2 ton | 22.0 | 31.5 | 34.0 | 41.5 | 52.8 | A |
| X | 42 | 3 ton | 25.5 | 36.5 | 40.0 | 48.5 | 60.5 | A |
| XI | 46 | 4 ton | 28.0 | 39.4 | 43.7 | 53.1 | 66.6 | A |

^aFor RSP Classes I–VIII, use Class 8 RSP fabric. For RSP Classes IX–XI, use Class 10 RSP fabric.

^bIntermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness.

^cd%, where % denotes the percentage of the total weight of the graded material.

^dValues shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

Replace the table in section 72-2.02C with:

07-15-16

Fabric Class

| Class | Largest rock gradation class used in slope protection |
|-------|-------------------------------------------------------|
| 8 | Classes I–VIII |
| 10 | Classes IX–XI |

80-4.02B(1)(c) Barbless Wire

The barbless wire must:

1. Comply with ASTM A641/A641M
2. Be at least 14-gauge wire
3. Have a Class 1 zinc coating

80-4.02B(1)(d) Posts

Each post must:

1. Comply with ASTM F1083
2. Be standard weight, schedule 40 steel pipe with a nominal pipe size of 1 inch
3. Be galvanized steel fence post conforming to ASTM A702

80-4.02B(2) Temporary Desert Tortoise Fences

The materials for a temporary desert tortoise fence must comply with section 80-4.02B(1), except the hardware cloth must be made of at least 16-gauge wire.

80-4.02C Construction

80-4.02C(1) General

Extend the hardware cloth a minimum of 24 inches above the ground.

Plumb the posts and pull the hardware cloth taut. Correct any alignment issues.

80-4.02C(2) Permanent Desert Tortoise Fences

Excavate the ground to form a trench before installing the posts and hardware cloth. Embed the posts at maximum 5-foot intervals into the ground. If T posts are used, use 5-foot lengths and embed the posts to match the above-ground height shown for the posts.

Securely fasten the hardware cloth to the posts with wire ties and to barbless wire with hog rings as shown. Pass the wire ties through the hardware cloth. Encircle the posts and barbless wire with the ties and tie them by twisting a minimum of 3 complete turns.

Bend the twisted ends of the ties down to prevent possible snagging. Close hog rings with their ends overlapping.

Bury the hardware cloth a minimum of 12 inches into the ground. Install the cloth in 1 continuous piece. You may cut the cloth into shorter segments if authorized.

Overlap the hardware cloth segments at posts, with a minimum overlap of 6 inches centered at a post. Wire tie the overlapped cloth to posts as shown. Prevent fraying by threading barbless wire along the vertical edges of the hardware cloth on either side of the post or use 3 equally spaced hog rings (6 hog rings per location) along each wire cloth edge.

Where bedrock or caliche substrate is encountered, use the bent hardware cloth detail if authorized. Transitions from buried-to-bent or bent-to-buried configuration must occur at a post location with a minimum 6-inch overlap of the hardware cloth as shown. The maximum spacing for hold down pins is 24 inches on center. Anchor in place with hold down pins the beginning and end corners of the hardware cloth placed on the ground.

Backfill the removed earth material into the trench created to install the hardware cloth and posts. Use an 8 lb or heavier hand tamper to compact the backfill around the posts and hardware cloth. Install a post at each corner of the cloth segments.

Add between the 2nd and 3rd paragraphs of section 84-8.03A:

07-15-16

Modify rumble strip spacing to avoid locating a groove on a concrete pavement joint.

Replace the 3rd paragraph of section 84-8.03A with:

07-15-16

Indentations must comply with the dimensions shown and not vary more than:

1. 10 percent in length
2. 0.06 inch in depth
3. 10 percent in width
4. 1 inch in center-to-center spacing between rumble strips

Add to the end of section 84-8.03A:

07-15-16

The noise level created by the combined grinding activities must not exceed 86 dBA when measured at a distance of 50 feet at right angles to the direction of travel.

Break rumble strips before and after intersections, driveways, railroad crossings, freeway gore areas, and freeway ramps. Place breaks and break distances as shown. You may adjust breaks and the break distances as needed at low-volume driveways or other locations if authorized.

Delete *new* in the 1st paragraph of section 84-8.03B.

07-15-16

Add to the end of section 84-8.03B:

07-15-16

Remove grinding residue under section 13-4.03E(7).

Replace the 1st paragraph of section 84-8.03C with:

07-15-16

Construct rumble strips in the top layer of HMA and asphalt concrete surfacing by the ground-in method.

Add between the 2nd and 3rd paragraphs of section 84-8.03C:

07-15-16

Dispose of the removed material.

Delete the 2nd paragraph of section 84-8.03C.

07-15-16

Replace 37-2 in the 3rd paragraph of section 84-8.03C with:

07-15-16

37-4.02

audible speech walk message: Audible prerecorded message that communicates to pedestrians which street has the walk interval.

channel: Discrete information path.

CALiPER: Commercially Available LED Product Evaluation and Reporting. A U.S. Department of Energy program that individually tests and provides unbiased information on the performance of commercially available LED luminaires and lights.

controller assembly: Assembly for controlling a system's operations, consisting of a controller unit and auxiliary equipment housed in a waterproof cabinet.

controller unit: Part of the controller assembly performing the basic timing and logic functions.

correlated color temperature: Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.

detector: Detector as defined in the *California MUTCD*.

electrolier: Assembly of a lighting standard and luminaire.

flasher: Device for opening and closing signal circuits at a repetitive rate.

flashing beacon control assembly: Assembly of switches, circuit breakers, terminal blocks, flasher, wiring, and other necessary electrical components housed in a single enclosure for operating a beacon.

house side lumens: Lumens from a luminaire directed to light up areas between the fixture and the pole, such as sidewalks at intersection or areas off the shoulders on freeways.

illuminance gradient: Ratio of the minimum illuminance on a 1-foot square of sign panel to that on an adjacent 1-foot square of sign panel.

inductive loop detector: Detector capable of being actuated by an inductance change caused by a vehicle passing or standing over the loop. An inductive loop detector includes a loop or group of loops installed in the roadway and a lead-in cable installed and connected inside a controller cabinet.

junction temperature: Temperature of the electronic junction of the LED device. The junction temperature is critical in determining photometric performance, estimating operational life, and preventing catastrophic failure of the LED.

L70: Extrapolated life in hours of the luminaire when the luminous output depreciates 30 percent from the initial values.

lighting standard: Pole and mast arm supporting the luminaire.

LM-79: Test method from the Illumination Engineering Society of North America specifying the test conditions, measurements, and report format for testing solid state lighting devices, including LED luminaires.

LM-80: Test method from the Illumination Engineering Society of North America specifying the test conditions, measurements, and report format for testing and estimating the long-term performance of LEDs for general lighting purposes.

luminaire: Assembly that houses the light source and controls the light emitted from the light source.

National Voluntary Laboratory Accreditation Program: U.S. Department of Energy program that accredits independent testing laboratories.

powder coating: Coating applied electrostatically using exterior-grade, UV-stable, polymer powder.

power factor: Ratio of the real power component to the complex power component.

pre-timed controller assembly: Assembly operating traffic signals under a predetermined cycle length.

programming mechanism: Device to program the accessible pedestrian signal operation.

pull box: Box with a cover that is installed in an accessible place in a conduit run to facilitate the pulling in of wires or cables.

push button information message: Push button information message as defined in the *California MUTCD*.

push button locator tone: Push button locator tone as defined in the *California MUTCD*.

signal face: Signal face as defined in the *California MUTCD*.

signal head: Signal head as defined in the *California MUTCD*.

signal indication: Signal indication as defined in the *California MUTCD*.

signal section: Signal section as defined in the *California MUTCD*.

signal standard: Pole with or without mast arms carrying 1 or more signal faces.

street side lumens: Lumens from a luminaire directed to light up areas between the fixture and the roadway, such as traveled ways and freeway lanes.

surge protection device: Subsystem or component that protects equipment against short-duration voltage transients in power line.

total harmonic distortion: Ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform.

traffic-actuated controller assembly: Assembly for operating traffic signals under the varying demands of traffic as registered by detector actuation.

traffic phase: Traffic phase as defined in the *California MUTCD*.

vehicle: Vehicle as defined in the *California Vehicle Code*.

vibrotactile pedestrian device: Vibrotactile pedestrian device as defined in the *California MUTCD*.

86-1.01C Submittals

86-1.01C(1) General

Within 15 days after Contract approval, submit a list of equipment and materials you propose to install.

Submit the list before shipping equipment and materials to the job site. The list must include:

1. Manufacturer's name
2. Make and model number
3. Month and year of manufacture
4. Lot and serial numbers
5. Contract number
6. Your contact information

Submit confirmation of the vendor's acceptance of the order for the electrical equipment and materials as an informational submittal.

Submit 3 sets of computer-generated, schematic wiring diagrams for each cabinet.

Diagrams, plans, and drawings must be prepared using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

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

Do not include costs for the traffic control system in the schedule of values.

Submit a manufacturer's maintenance manual or combined maintenance and operation manual as an informational submittal. The manual must have a master item index that includes:

1. Specifications
2. Design characteristics
3. General operation theory
4. Function of all controls
5. Troubleshooting procedure
6. Parts list, descriptions, stock numbers, and settings
7. Block circuit diagram
8. Layout of components
9. Schematic diagrams

86-1.01C(2) Pull Boxes

Submit the manufacturer's installation instructions for pull boxes, including:

1. Quantity and size of entries that can be made without degrading the strength of the pull box below the load rating
2. Locations where side entries can be made
3. Acceptable method for creating the entry

Submit load-rating test reports for pull boxes from a NRTL.

86-1.01C(3) LED Luminaires

Submit for an LED luminaire:

1. Maximum power in watts
2. Maximum designed junction temperature
3. Heat sink area in square inches
4. Designed junction-to-ambient thermal resistance calculation with thermal resistance components clearly defined
5. L70 in hours when extrapolated for the average nighttime operating temperature
6. Life expectancy based on the junction temperature
7. Manufacturer's data sheet for the power supply, including the rated life

Submit the manufacturer's QC test data for LED luminaires as an informational submittal.

86-1.01C(4) Low-Pressure Sodium Luminaires

Submit the manufacturer's QC test data for low-pressure sodium luminaires as an informational submittal.

86-1.01C(5) Service Equipment Enclosures

Submit shop drawings for a service equipment enclosure to METS.

86-1.01C(6) Signal Heads

Submit a certificate of compliance and the manufacturer's QC test data for signal heads as an informational submittal.

86-1.01C(7) LED Signal Modules

Submit the manufacturer's QC test data for LED signal modules as an informational submittal.

86-1.01C(8) Visors

Submit a certificate of compliance and the manufacturer's QC test data for visors as an informational submittal.

86-1.01C(9) LED Countdown Pedestrian Signal Face Modules

Submit the manufacturer's QC test data for LED countdown pedestrian signal face modules as an informational submittal.

86-1.01C(10) Accessible Pedestrian Signals

Submit the manufacturer's QC test data for accessible pedestrian signals as an informational submittal.

86-1.01D Quality Assurance**86-1.01D(1) General**

Electrical equipment must comply with one or more of the following standards:

1. ANSI
2. ASTM
3. EIA/ECIA
4. NEMA
5. NETA
6. UL/NRTL
7. TIA

Materials must comply with:

1. FCC rules
2. ITE standards
3. NEC
4. California Electrical Code

86-1.01D(2) Source Quality Control

Service equipment enclosures and cabinets must be inspected and tested at the source.

86-1.01D(3) Department Acceptance

Deliver material and equipment for testing to METS.

Allow 30 days for testing. The Department notifies you when testing is complete.

If the Department accepts the material or equipment, you must pick it up from the test site and deliver it to the job site.

If the Department rejects material or equipment, remove it within 5 business days after you are notified it is rejected. If it is not removed within that period, the Department may remove it and ship it to you and deduct the costs of labor, material and shipping.

Resubmit a new sample and allow 30 days for retesting. The retesting period starts when the replacement material or equipment is delivered to METS.

86-1.02 MATERIALS**86-1.02A General**

Anchor bolts, anchor bars or studs, and nuts and washers must comply with section 75-1.02.

Bolt threads must accept galvanized standard nuts without requiring tools or causing removal of protective coatings.

86-1.02B Conduit and Accessories

86-1.02B(1) General

Conduit and fittings must comply with the requirements shown in the following table:

| Type | Requirement |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Must be hot-dip galvanized rigid steel complying with UL 6 and ANSI C80.1. The zinc coating must comply with copper sulfate test requirements in UL 6. Fittings must be electrogalvanized and certified under UL 514B. |
| 2 | Must comply with requirements for Type 1 conduit and be coated with PVC or polyethylene. The exterior thermoplastic coating must have a minimum thickness of 35 mils. The internal coating must have a minimum thickness of 2 mils. Coated conduit must comply with NEMA RN 1, or NRTL PVC-001. |
| 3 | Must be Type A, extruded, rigid PVC conduit complying with UL 651 or must be HDPE conduit complying with UL 651A. |
| 4 | Must have an inner, flexible metal core covered by a waterproof, nonmetallic, sunlight-resistant jacket, and must be UL listed for use as a grounding conductor. Fittings must be certified under UL 514B. |
| 5 | Must be intermediate steel complying with UL 1242 and ANSI C80.6. The zinc coating must comply with copper sulfate test requirements specified in UL 1242. Fittings must be electrogalvanized and certified under UL 514B. |

Bonding bushings installed on metal conduit must be insulated and either a galvanized or zinc-alloy type.

86-1.02B(2) Structures Accessories

Steel hangers, steel brackets, and other fittings used to support conduit in or on a wall or bridge superstructure must comply with section 75-3.

Precast concrete cradles for conduit must be made of minor concrete and commercial-quality welded wire fabric. The minor concrete must contain a minimum of 590 lb of cementitious material per cubic yard. The cradles must be moist cured for a minimum of 3 days.

86-1.02C Pull Boxes

86-1.02C(1) General

Pull box cover must have a marking on the top that is:

1. Clearly defined
2. Uniform in depth
3. Parallel to either side
4. 1 to 3 inches in height

Cover marking must be:

1. *SERVICE* for service circuits between a service point and service disconnect
2. *SERVICE IRRIGATION* for circuits from a service equipment enclosure to an irrigation controller
3. *SERVICE BOOSTER PUMP* for circuits from a service equipment enclosure to the booster pump
4. *TDC POWER* for circuits from a service equipment enclosure to telephone demarcation cabinet
5. *LIGHTING* for a lighting system
6. *SIGN ILLUMINATION* for a sign illumination system
7. *SIGNAL AND LIGHTING* for a signal and lighting system
8. *RAMP METER* for a ramp metering system
9. *TMS* for a traffic monitoring station
10. *FLASHING BEACON* for a flashing beacon system
11. *CMS* for a changeable message sign system

12. *INTERCONNECT* for an interconnect conduit and cable system

The load rating must be stenciled on the inside and outside of the pull box and the cover.

If a transformer or other device must be placed in the pull box, include recesses for a hanger.

The hardware must be stainless steel with 18 percent chromium and 8 percent nickel content.

86-1.02C(2) Nontraffic Pull Boxes

A nontraffic pull box and cover must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for Tier 22 load rating and must be gray or brown.

Each new pull box must have a cover with an electronic marker cast inside.

A pull box extension must be made of the same material as the pull box. The extension may be another pull box if the bottom edge of the pull box fits into the opening for the cover.

The bolts, nuts, and washers must be a captive design and galvanized. Captive bolts for securing the cover of nontraffic pull boxes must be capable of withstanding a torque from 55 to 60 ft-lb and a minimum pull-out strength of 750 lb.

86-1.02C(3) Traffic Pull Boxes

A traffic pull box and cover must comply with ASTM C857 for HS20-44 loading.

The frame must be anchored to the box with 2-1/4-inch-long concrete anchors with a 1/4 inch diameter. A no. 3-1/2(T) pull box must have 4 concrete anchors, one placed in each corner. No. 5(T) and no. 6(T) pull boxes must have 6 concrete anchors, one placed in each corner and one near the middle of each of the longer sides.

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

Before galvanizing a steel or cast iron cover, the manufacturer must apply the cover marking by one of the following methods:

1. Use a cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten the strip to the cover with 1/4-inch, flathead, stainless steel machine bolts and nuts. Peen the bolts after tightening.
2. Use a sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten the strip to the cover by spot welding, tack welding, or brazing with 1/4-inch stainless steel rivets or 1/4-inch, roundhead, stainless steel machine bolts and nuts. Peen the bolts after tightening.

The steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must be no more than 1/8 inch above the top of the cover.

86-1.02C(4) Reserved

86-1.02D Tapes

86-1.02D(1) General

Reserved

86-1.02D(2) Pull Tape

Pull tape must be a flat, woven, lubricated, soft-fiber, polyester tape with a minimum tensile strength of 1,800 lb. The tape must have sequential measurement markings every 3 feet.

86-1.02D(3) Reserved

86-1.02E Reserved

86-1.02F Conductors and Cables

86-1.02F(1) Conductors

86-1.02F(1)(a) General

Reserved

86-1.02F(1)(b) Reserved

86-1.02F(1)(c) Copper Conductors

86-1.02F(1)(c)(i) General

Copper wire must comply with ASTM B3 and B8.

Conductor must be clearly and permanently marked the entire length of its outer surface with:

1. Manufacturer's name or trademark
2. Insulation-type letter designation
3. Conductor size
4. Voltage
5. Temperature rating
6. Number of conductors for a cable

The minimum insulation thickness and color code requirements must comply with NEC.

A conductor must be UL listed or NRTL certified and rated for 600 V(ac).

Insulation for no. 14 to no. 4 conductors must be one of the following:

1. Type TW PVC under ASTM D2219
2. Type THW PVC
3. Type USE, RHH, or RHW cross-linked polyethylene

The insulation for no. 2 and larger conductors must be one of the above or THWN.

Conductors must be identified as shown in the following table:

Conductor Identification

| Circuit | Signal phase or function | Identification | | | Size |
|----------------------------------------|-----------------------------------------------|-------------------------------|---------------------|---------------------|------|
| | | Insulation color ^d | | Band symbols | |
| | | Base | Stripe ^a | | |
| Signals (vehicle) ^{a, b} | 2, 6 | Red, yel, brn | Blk | 2, 6 | 14 |
| | 4, 8 | Red, yel, brn | Ora | 4, 8 | 14 |
| | 1, 5 | Red, yel, brn | None | 1, 5 | 14 |
| | 3, 7 | Red, yel, brn | Pur | 3, 7 | 14 |
| | Ramp meter 1 | Red, yel, brn | None | NBR | 14 |
| | Ramp meter 2 | Red, yel, brn | Blk | NBR | 14 |
| Pedestrian signals | 2p, 6p | Red, brn | Blk | 2p, 6p | 14 |
| | 4p, 8p | Red, brn | Ora | 4p, 8p | 14 |
| | 1p, 5p | Red, brn | None | 1p, 5p | 14 |
| | 3p, 7p | Red, brn | Pur | 3p, 7p | 14 |
| Pedestrian push buttons | 2p, 6p | Blu | Blk | P-2, P-6 | 14 |
| | 4p, 8p | Blu | Ora | P-4, P-8 | 14 |
| | 1p, 5p | Blu | None | P-1, P-5 | 14 |
| | 3p, 7p | Blu | Pur | P-3, P-7 | 14 |
| Traffic signal controller cabinet | Ungrounded circuit conductor | Blk | None | CON-1 | 6 |
| | Grounded circuit conductor | Wht | None | CON-2 | 6 |
| Highway lighting pull box to luminaire | Ungrounded - line 1 | Blk | None | NBR | 14 |
| | Ungrounded - line 2 | Red | None | NBR | 14 |
| | Grounded | Wht | None | NBR | 14 |
| Multiple highway lighting | Ungrounded - line 1 | Blk | None | ML1 | 10 |
| | Ungrounded - line 2 | Red | None | ML2 | 10 |
| Lighting control | Ungrounded - PEU | Blk | None | C1 | 14 |
| | Switching leg from PEU unit or SM transformer | Red | None | C2 | 14 |
| Service | Ungrounded - line 1 (signals) | Blk | None | NBR | 6 |
| | Ungrounded - line 2 (lighting) | Red | None | NBR | 8 |
| Sign lighting | Ungrounded - line 1 | Blk | None | SL-1 | 10 |
| | Ungrounded - line 2 | Red | None | SL-2 | 10 |
| Flashing beacons | Ungrounded between flasher and beacons | Red or yel | None | F-Loc. ^c | 14 |
| Grounded circuit conductor | Pedestrian push buttons | Wht | Blk | NBR | 14 |
| | Signals and multiple lighting | Wht | None | NBR | 10 |
| | Flashing beacons and sign lighting | Wht | None | NBR | 12 |
| | Lighting control | Wht | None | C-3 | 14 |
| | Service | Wht | None | NBR | 14 |
| Railroad preemption | | Blk | None | R | 14 |
| Spares | | Blk | None | NBR | 14 |

NBR = No band required PEU=Photoelectric unit

^aOn overlaps, the insulation is striped for the 1st phase in the designation, e.g., phase (2+3) conductor is striped as for phase 2.

^bBand for overlap and special phases as required

^cFlashing beacons having separate service do not require banding.

^dColor Code: Yel-Yellow, Brn-Brown, Blu-Blue, Blk-Black, Wht-White, Ora-Orange, Pur-Purple

The insulation color must be homogeneous throughout the full depth of the insulation. The identification stripe must be continuous throughout the length of the conductor.

86-1.02F(1)(c)(ii) Bonding Jumpers and Equipment Grounding Conductors

A bonding jumper must be copper wire or copper braid of the same cross-sectional area as a no. 8 conductor or larger.

An equipment grounding conductor may be bare or insulated.

86-1.02F(1)(c)(iii) Inductive Loop Conductors

Inductive loop conductor must comply with the requirements shown in the following table:

Conductor Requirements for Inductive Loop Detectors

| Loop wire | Requirement |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type 1 | Type RHW-USE neoprene-jacketed or Type USE cross-linked polyethylene, insulated, no. 12, stranded copper wire with a minimum 40-mils insulation thickness at any point. |
| Type 2 | Type THWN or Type XHHW, no. 14, stranded copper wire in a plastic tubing. The plastic tubing must be polyethylene or vinyl rated for use at 105 °C and resistant to oil and gasoline. The outside diameter of the tubing must be at most 0.27 inch with a wall thickness of at least 0.028 inch. |

86-1.02F(1)(d) Reserved

Reserved

86-1.02F(2) Cables

86-1.02F(2)(a) General

Reserved

86-1.02F(2)(b) Reserved

Reserved

86-1.02F(2)(c) Reserved

86-1.02F(2)(d) Copper Cables

86-1.02F(2)(d)(i) General

The conductor wire size for a detector lead-in cable must comply with the requirements of ASTM B286.

Cable, except a detector lead-in cable, must be clearly and permanently marked the entire length of its outer surface with:

1. Manufacturer's name or trademark
2. Insulation-type letter designation
3. Conductor size
4. Voltage
5. Temperature rating
6. Number of conductors for a cable

86-1.02F(2)(d)(ii) Conductors Signal Cables

A conductors signal cable must have a black polyethylene jacket with an inner polyester binder sheath. The cable jacket must be rated for 600 V(ac) and 75 degrees C. Filler material, if used, must be polyethylene.

The individual conductors in the cable must be solid copper complying with ASTM B286 with Type THWN insulation. The minimum thickness of insulation must comply with NEC for conductor sizes no. 14 to no.10. The minimum thickness of the nylon jacket must be 4 mils.

Cable must comply with the requirements shown in the following table:

| Cable type ^a | Conductor quantity and type | Cable jacket thickness (mils) | | Maximum nominal outside diameter (inch) | Conductor color code |
|-------------------------|-----------------------------|-------------------------------|---------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Average | Minimum | | |
| 3CSC | 3 no. 14 | 44 | 36 | 0.40 | Blue/black, blue/orange, white/black stripe |
| 5CSC | 5 no. 14 | 44 | 36 | 0.50 | Red, yellow, brown, black, white |
| 9CSC | 8 no. 14 1 no. 12 | 60 | 48 | 0.65 | No. 12 - white, no. 14 - red, yellow, brown, black, and red/black, yellow/black, brown/black, white/black stripe |
| 12CSC | 11 no. 14 1 no. 12 | 60 | 48 | 0.80 | No. 12 - white, no. 14 - red, yellow, brown, red/black stripe, yellow/black stripe, brown/black stripe, black/red stripe, black/white stripe, black, red/white stripe, brown/white stripe |
| 28CSC | 27 no. 14 1 no. 10 | 80 | 64 | 0.90 | No. 10 - white no. 14 - red/black stripe, yellow/black stripe, brown/black stripe, red/orange stripe, yellow/orange stripe, brown/orange stripe, red/silver stripe, yellow/silver stripe, brown/silver stripe, red/purple stripe, yellow/purple stripe, brown/purple stripe, red/2 black stripes, brown/2 black stripes, red/2 orange stripes, brown/2 orange stripes, red/2 silver stripes, brown/2 silver stripes, red/2 purple stripes, brown/2 purple stripes, blue/black stripe, blue/orange stripe, blue/silver stripe, blue/purple stripe, white/black stripe, black/red stripe, black |

86-1.02F(2)(d)(iii) Detector Lead-in Cables

Conductors for a loop detector lead-in cable must be two no. 16, 19-by-29, stranded, tinned copper wires with calculated cross-sectional areas complying with ASTM B286, table 1 and must comply with the requirements shown in the following table:

Conductor Requirements for Loop Detector Lead-In Cables

| Lead-in cable | Requirement |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type B | Insulated with 20 mils of high-density polyethylene. Conductors must be twisted together with at least 2 turns per foot, and the twisted pair must be protected with a copper or aluminum polyester shield. A minimum no. 20 copper drain wire must be connected to the equipment ground within the cabinet. Cable must have a high-density polyethylene or high-density polypropylene outer jacket with a nominal thickness of 32 mils. Include an amorphous, interior, moisture penetration barrier of nonhydroscopic polyethylene or polypropylene fillers. |
| Type C | Comply with International Municipal Signal Association Specification no. 50-2. A minimum no. 20 copper drain wire must be connected to the equipment ground within the cabinet. |

86-1.02F(2)(d)(iv) Reserved

86-1.02F(2)(d)(v) Signal Interconnect Cables

A signal interconnect cable must be a 6-pair type with stranded, tinned, copper no. 20 conductors. The insulation for each conductor must be color-coded polypropylene with a minimum 13-mils nominal thickness. The conductors must be in color-coded, twisted pairs. Each pair must be wrapped with an aluminum polyester shield and have a no. 22 or larger, stranded, tinned, copper drain wire inside the shielded pair.

The cable jacket must be black HDPE rated for a minimum of 300 V(ac) and 60 degrees C. The jacket must have a minimum nominal wall thickness of 40 mils.

86-1.02F(2)(e) Reserved

86-1.02G Equipment Identification Characters

Equipment identification characters must be 2-1/2 inch, series D lettering, except on wood poles, they must be 3-inch lettering.

The characters must be self-adhesive reflective labels or paint, except on wood poles, they must be embossed on aluminum.

86-1.02H Splicing Materials

Splicing materials include:

1. Connectors
2. Electrical insulating coating
3. PVC electrical tape
4. Butyl rubber stretchable tape
5. PVC pressure-sensitive adhesive tape
6. Heat shrink tubing

Connectors must be C-shaped compression or butt type.

Electrical insulating coating must be a fast drying sealant with low nontoxic fumes.

PVC electrical tape must have a minimum thickness of 80 mils.

Butyl rubber stretchable tape with liner must have a minimum thickness of 120 mils.

PVC pressure-sensitive adhesive electrical tape must have a minimum thickness of 6 mils.

Electrical tapes must be self-fusing, oil- and flame-resistant, synthetic rubber and be UL listed or NRTL certified.

Heat-shrink tubing must be made of irradiated polyolefin tubing with a minimum wall thickness of 40 mils before contraction and an adhesive mastic inner wall. When heated, the inner wall must melt and fill the crevices and interstices of the covered splice area and the outer wall must shrink to form a waterproof insulation.

Heat-shrink tubing must comply with the requirements for extruded, insulating tubing at 600 V(ac) specified in UL Standard 468D and ANSI C119.1 and the requirements shown in the following table:

Heat-Shrink Tubing Requirements

| Quality characteristic | Requirement |
|------------------------------------------------------------|------------------------------|
| Shrinkage ratio of supplied diameter ^a (max, %) | 33 |
| Dielectric strength (min, kV/in) | 350 |
| Resistivity (min, Ω/in) | 25 x 10 ¹³ |
| Tensile strength (min, psi) | 2,000 |
| Operating temperature (°C) | -40–90 (135 °C in emergency) |
| Water absorption (max, %) | 0.5 |

^aWhen heated to 125 °C and allowed to cool to 25 °C

86-1.02I Connectors and Terminals

A connector and terminal must comply with SAE-AS7928 and be a crimp type, rated for 600 V(ac) and either UL listed or NRTL certified.

86-1.02J Standards, Poles, Pedestals, and Posts

Standards for signals, lighting, and flashing beacons, poles for closed circuit television, pedestals for cabinets, posts for extinguishable message sign and posts for pedestrian push button assemblies must comply with section 56-3.

86-1.02K Luminaires

86-1.02K(1) General

Luminaire must be either LED or low-pressure-sodium type.

86-1.02K(2) LED Luminaires

LED luminaire must be on the Authorized Material List for LED luminaires and must:

1. Be self-contained, not requiring assembly.
2. Comply with UL 1598 for luminaires in wet locations.
3. Have a power supply with:
 - 3.1. ANSI/IEC rating of at least IP65.
 - 3.2. 2 leads to accept standard 0-10 V(dc).
 - 3.3. Dimming control compatible with IEC 60929, Annex E. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.
 - 3.4. Case temperature self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.
4. Weigh no more than 35 lb.
5. Have a minimum operating life of 63,000 hours when operated for an average time of 11.5 hours at an average temperature of 70 degrees F.
6. Be designed to operate over a temperature range from -40 to 130 degrees F.
7. Be operationally compatible with photoelectric controls.
8. Have a correlated color temperature range from 3,500 to 6,500 K and a color rendering index of 65 or greater.

9. Have a maximum-effective projected area of 1.4 sq ft when viewed from either side or end.
10. Have a housing color that matches a color no. 26152 to 26440, 36231 to 36375, or 36440 of FED-STD-595.
11. Have an ANSI C136.41-compliant, locking-type, photocontrol receptacle with dimming connections and a watertight shorting cap.
12. Comply with LM-79, LM-80 and California Test 611.

The individual LEDs must be connected such that a catastrophic loss or a failure of 1 LED does not result in the loss of more than 20 percent of the luminous output of the luminaire.

The luminaire must be permanently marked inside the unit and outside of its packaging box. Marking consists of:

1. Manufacturer's name or trademark
2. Month and year of manufacture
3. Model, serial, and lot numbers
4. Rated voltage, wattage, and power in VA

An LED luminaire's onboard circuitry must include a surge protection device to withstand high-repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The device must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C64.41.2 for location category C-High. The surge protection device must comply with UL 1449 and ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

An LED luminaire and its associated onboard circuitry must comply with the Class A emission limits under 47 CFR 15(B) for the emission of electronic noise.

The fluctuations of line voltage must have no visible effect on the luminous output.

The operating voltage may range from 120 to 480 V(ac), 60 ± 3 Hz. Luminaire must operate over the entire voltage range or the voltage range must be selected from one of the following:

1. Luminaire must operate over a voltage range from 95 to 277 V(ac). The operating voltages for this option are 120 V(ac) and 240 V(ac).
2. Luminaire must operate over a voltage range from 347 to 480 V(ac). The operating voltage for this option is 480 V(ac).

LED luminaire must have a power factor of 0.90 or greater. The total harmonic distortion, current, and voltage induced into a power line by a luminaire must not exceed 20 percent. The L70 of the luminaire must be the minimum operating life or greater. Illuminance measurements must be calibrated to standard photopic calibrations.

The maximum power consumption and maintained illuminance of the LED luminaires must comply with the isofootcandle curves as shown.

LED luminaire must not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical and 2.5 percent of the rated lumens to project above 90 degrees from vertical.

Luminaire must have passive thermal management with enough capacity to ensure proper heat dissipation and functioning of the luminaire over its minimum operating life. The maximum junction temperature for the minimum operating life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans or other mechanical devices is not allowed for cooling the luminaire. The heat sink must be made of aluminum or other material of equal or lower thermal resistance. The luminaire must contain circuitry that automatically reduces the power to the LEDs so the maximum junction temperature is not exceeded when the ambient temperature is 100 degrees F or greater.

The luminaire's housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B117. All aluminum used in housings and brackets must be made of a marine-grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

The housing must be designed to prevent the buildup of water on its top surface. Exposed heat sink fins must be oriented to allow water to run off the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an UL 60529 rating of IP66. The power supply enclosure must be protected to at least an UL 60529 rating of IP43.

The housing must have a slip fitter capable of being mounted on a 2-inch-diameter pipe tenon. Slip fitter must:

1. Fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches
2. Be adjustable to a minimum of ± 5 degrees from the axis of the tenon in a minimum of 5 steps: +5, +2.5, 0, -2.5, -5
3. Have clamping brackets that:
 - 3.1. Are made of corrosion-resistant materials or treated to prevent galvanic reactions
 - 3.2. Do not bottom out on the housing bosses when adjusted within the designed angular range
 - 3.3. Do not permanently set in excess of 1/32 inch when tightened

Each refractor or lens must be made of UV-inhibiting high-impact plastic, such as acrylic or polycarbonate, or heat- and impact-resistant glass. The refractor or lens must be resistant to scratching. Polymeric materials, except for the lenses of enclosures containing either the power supply or electronic components of the luminaire, must be made of UL94 V-0 flame-retardant materials.

An LED luminaire and its internal components must be able to withstand mechanical shock and vibration.

If the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire's housing separately from the refractor or flat lens frame. The door must be secured to the housing to prevent accidental opening. A safety cable must mechanically connect the door to the housing.

An LED luminaire must have a barrier-type terminal block secured to the housing to connect field wires. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6.

The conductors and terminals must be identified and marked.

86-1.02K(3) Low-Pressure Sodium luminaires

A low-pressure sodium luminaire must be an enclosed cutoff or semi-cutoff type and be self-contained, not requiring assembly.

The housing must be either (1) a minimum 1/16-inch-thick, corrosion-resistant, die-cast aluminum sheet and plate with concealed continuous welds or (2) a minimum 3/32-inch-thick, acrylonitrile-butadiene-styrene sheet material on a cast aluminum frame. The housing must provide mounting for all electrical components and a slip fitter. The housing must be divided into optical and power compartments that are individually accessible for service and maintenance.

The painted exterior surface of the luminaire must be finished with a fused coating of electrostatically applied polyester powder paint or other UV-inhibiting film. The color must be aluminum gray.

A sealing ring must be installed in the pipe tenon opening to prevent the entry of water and insects into the power and optical compartments. The ring must be made of high-temperature neoprene or equal material.

The power unit assembly must be accessible through a weather-tight, hinged cover secured to the housing with spring latches or captive screws.

The luminaire's hardware must be stainless steel or cadmium plated. Removable components must be secured with machine screws or bolts instead of sheet metal screws.

A semi-cutoff luminaire or a molded refractor-style cutoff luminaire must include a refractor. Other cutoff luminaires must include a flat lens. The refractor assembly and flat lens assembly must be designed to rigidly maintain their shape and be hinged and secured to the housing with spring latches.

The refractor must be either a 1-piece injection-molded polycarbonate with a minimum thickness of 3/32 inch or a 1-piece injection-molded acrylic with a minimum thickness of 1/8 inch. Alternate methods of manufacturing the refractor may be authorized provided minimum specified thicknesses are maintained.

The flat lens must be a 1-piece polycarbonate with a minimum thickness of 3/32 inch, mounted to a metal frame.

The lamp socket must be made of high-temperature, flame-retardant, thermoset material with self-wiping contacts or an equal. The socket must be rated for 660 W and 1,000 V(ac). The position of the socket and support must maintain the lamp in the correct relationship with the reflector and refractor for the designed light distribution pattern. The reflector may be an integral part of the housing.

The luminaire must comply with the isofootcandle curves as shown.

Low-pressure sodium lamp must:

1. Be a 180 W, single-ended, bayonet-base, tubular, gas-discharge lamp
2. Maintain a minimum of 93 percent of its initial lumens over its rated life
3. Reach 80 percent of its light output within 10 minutes
4. Restrike within 1 minute after a power outage or voltage drop at the lamp socket
5. Have ANSI L74/E designation

The lamp operating position must be at ± 20 degrees from the horizontal.

Lamp must comply with the minimum performance requirements shown in the following table:

| Minimum Performance Requirements | |
|--------------------------------------|-------------|
| Quality characteristic | Requirement |
| Initial lumens (lm) | 33,000 |
| Rated average life at 10 h/start (h) | 18,000 |

The low-pressure sodium lamp ballast must be an autotransformer or high-reactance type. The power factor must be not less than 90 percent when the ballast is operated at the nominal line voltage with a nominally-rated reference lamp. The lamp wattage regulation spread must not vary by more than ± 6 percent for ± 10 percent input voltage variation from nominal through life.

At the line voltage, the ballast must have a lamp current crest factor not exceeding 1.8 and ballast loss not exceeding 24 percent for a 180 W ballast.

The ballast must include a multi-circuit connector for quick disconnection.

86-1.02K(4) Reserved

86-1.02L Reserved

86-1.02M Photoelectric Controls

Photoelectric control types are as shown in the following table:

Photoelectric Control Types

| Control type | Description |
|--------------|------------------------------------------------------------------------------------------------------|
| I | Pole-mounted photoelectric unit. Test switch housed in an enclosure. |
| II | Pole-mounted photoelectric unit. Contactor and test switch located in a service equipment enclosure. |
| III | Pole-mounted photoelectric unit. Contactor and a test switch housed in an enclosure. |
| IV | A photoelectric unit that plugs into a NEMA twist-lock receptacle, integral with the luminaire. |
| V | A photoelectric unit, contactor, and test switch located in a service equipment enclosure. |

The pole-mounted adaptor for Type I, II, and III photoelectric controls must include a terminal block and cable supports or clamps to support the wires.

The enclosure for Type I and III photoelectric controls must be a NEMA 3R type. The enclosure must have a factory-applied, rust-resistant prime coat and finish coat. The enclosure must be hot-dip galvanized or painted to match the color of the lighting standard.

Photoelectric unit must:

1. Have a screen to prevent artificial light from causing cycling.
2. Have a rating of 60 Hz, 105-130 V(ac), 210-240 V(ac), or 105-240 V(ac).
3. Operate at a temperature range from -20 to 55 degrees C.
4. Consume less than 10 W.
5. Be a 3-prong, twist-lock type with a NEMA IP 65 rating, ANSI C136.10-compliant
6. Have a fail-on state
7. Fit into a NEMA-type receptacle
8. Turn on from 1 to 5 footcandles and turn off from 1.5 to 5 times the turn-on level. Measurements must be made by procedures in *EEI-NEMA Standards for Physical and Electrical Interchangeability of Light-Sensitive Control Devices Used in the Control of Roadway Lighting*.

Type I, II, III, and V photoelectric controls must have a test switch to allow manual operation of the lighting circuit. Switch must be:

1. Single-hole mounting, toggle type
2. Single pole and single throw
3. Labeled *Auto-Test* on a nameplate

Photoelectric control's contactor must be:

1. Normally open
2. Mechanical-armature type with contacts of fine silver, silver alloy, or equal or better material
3. Installed to provide a minimum space of 2-1/2 inches between the contactor terminals and the enclosure's sides

The terminal blocks must be rated at 25 A, 600 V(ac), molded from phenolic or nylon material, and be the barrier type with plated-brass screw terminals and integral marking strips.

86-1.02N Fused Splice Connectors

The fused splice connector for 240 and 480 V(ac) circuits must simultaneously disconnect both ungrounded conductors. The connector must not have exposed metal parts except for the head of the stainless steel assembly screw. The head of the assembly screw must be recessed a minimum of 1/32 inch below the top of the plastic boss that surrounds the head.

The connector must protect the fuse from water or weather damage. Contact between the fuse and fuse holder must be spring loaded.

Fuses must:

1. Be standard, midget, ferrule type
2. Have a nontime-delay feature
3. Be 3/32 by 1-1/2 inches

86-1.02O Grounding Electrodes

Grounding electrode must be:

1. 1 piece
2. Minimum 10-foot length of one of the following:
 - 2.1. Galvanized steel rod or pipe not less than 3/4 inch in diameter
 - 2.2. Copper clad steel rod not less than 5/8 inch in diameter

86-1.02P Enclosures

86-1.02P(1) General

The enclosures must be rated NEMA 3R and include a dead front panel and a hasp with a 7/16-inch-diameter hole for a padlock.

The enclosure's machine screws and bolts must not protrude outside the cabinet wall.

The fasteners on the exterior of an enclosure must be vandal resistant and not be removable. The exterior screws, nuts, bolts, and washers must be stainless steel.

86-1.02P(2) Service Equipment Enclosures

A service equipment enclosure must be factory wired and manufactured from steel and galvanized or have factory-applied, rust-resistant prime and finish coats, except Types II and III.

Type II and III service equipment enclosures must:

1. Be made of 0.125-inch minimum thickness 5052-H32 aluminum sheet complying with ASTM B209.
2. Be manufactured using gas metal arc welding with bare aluminum welding electrodes. The electrodes must comply with AWS A5.10 Class ER5356.
3. Be manufactured using welding procedures, welders, and welding operators that comply with the requirements for welding procedures, welders, and welding operators in in AWS B2.1, "Specification for Welding Procedure and Performance Qualification."
4. Have full-seal weld exterior seams.
5. Exterior welds must be ground smooth and edges filed to a radius of at least 0.03 inch.
6. Have a surface finish that complies with MIL-A-8625 for a Type II, Class I coating, except the anodic coating must have a minimum thickness of 0.0007 inch and a minimum coating weight of 0.001 oz/sq in.

If a Type III enclosure houses a transformer of more than 1 kVA, the enclosure must have effective screened ventilation louvers of no less than 50 sq. in for each louver. The framed screen must be stainless no. 304 with a no. 10 size mesh and secured with at least 4 bolts.

The dead front panel on a Type III service equipment enclosure must have a continuous stainless steel or aluminum piano hinge. The panel must be secured with a latch or captive screws. No live part must be mounted on the panel.

The enclosure must be watertight and marked as specified in NEC to warn of potential electric-arc flash hazards.

Internal conductors for the photoelectric control unit must be 600 V(ac), 14 AWG (THHN) stranded machine tool wire. Where subject to flexing, 19 stranded wire must be used.

The meter area must be have a sealable, lockable, weather-tight cover that can be removed without the use of tools.

For Type III-A, III-B, and III-C enclosures, the meter socket must be a 5-clip type, and the landing lug must be suitable for multiple conductors.

For a Type III-D enclosure, the meter socket must be a 7-clip type, and the landing lug must be suitable for multiple conductors. The pedestal must comply with the Electric Utility Service Equipment Requirements Committee drawing no. 308 or 309.

Landing lugs must be (1) sized for the incoming service utility conductors, (2) compatible with either copper or aluminum conductors, and (3) made of copper or tin-plated aluminum. Live parts of the electrical equipment must be guarded against accidental contact.

The main and neutral busses of the enclosure must be made of tin-plated copper, be rated for 125 A, and be suitable for copper or aluminum conductors.

Each service equipment enclosure must have up to 2 main circuit breakers that will simultaneously disconnect ungrounded service-entrance conductors.

Circuit breaker for a service equipment enclosure must:

1. Be quick-break on either automatic or manual operation
2. Be trip indicating
3. Be internal-trip type
4. Be UL listed or NRTL certified and comply with UL 489 or equal
5. Be clearly marked with the frame size
6. Have an operating mechanism that is enclosed and trip-free from the operating handle on overload
7. Have the trip rating clearly marked on the operating handle
8. Have an interior made of copper

Circuit breakers used as disconnects must have a minimum interrupting capacity of 10,000 A, rms.

The interior of the enclosure must accept plug-in circuit breakers. A minimum of 6 standard single-pole circuit breakers, 3/4" nominal, must be provided for branch circuits.

Identify each circuit breaker and component by description using an engraved phenolic nameplate attached with stainless steel rivets or screws.

Nameplate must be installed:

1. Adjacent to the breaker on the dead front panel. The characters must be a minimum of 1/8 inch high.
2. Adjacent to the component on the back panel. The characters must be a minimum of 1/8 inch high.
3. At the top exterior of the door panel. The nameplate must include the system number, voltage, and number of phases engraved in minimum 3/16-inch-high characters.

A plastic-laminated wiring diagram must be attached inside the enclosure with brass eyelets by a UL-listed or NRTL-certified method.

86-1.02P(3) Lighting and Sign Illumination Enclosures

A lighting and sign illumination enclosure must be manufactured from steel and either galvanized, cadmium plated, or powder coated.

86-1.02Q Cabinets

86-1.02Q(1) General

Cabinets must be factory wired except for battery backup system cabinets.

The fasteners on the exterior of a cabinet, except for battery backup system cabinets, must be removable and vandal resistant. The exterior screws, nuts, bolts, and washers must be stainless steel.

Terminal blocks, circuit breakers, and a power supply must be UL approved.

86-1.02Q(2) Department-Furnished Controller Cabinets

A Department-furnished controller assembly consists of a Model 170E or 2070E controller unit, a wired controller cabinet, and all auxiliary equipment required to operate the system. The Department does not furnish anchor bolts.

86-1.02Q(3) Controller Cabinets

The controller cabinet must be a Model 334L, comply with TEES, and be on the Authorized Material List for traffic signal control equipment. The cabinet must have 3 drawer shelves. Each shelf must be attached to the tops of 2 supporting angles with 4 screws.

86-1.02Q(4) Telephone Demarcation Cabinets

86-1.02Q(4)(a) General

The doors of a telephone demarcation cabinet must be attached using continuous stainless steel piano hinges.

86-1.02Q(4)(b) Type A Telephone Demarcation Cabinets

Reserved

86-1.02Q(4)(c) Type B Telephone Demarcation Cabinets

A Type B telephone demarcation cabinet consists of a mounting panel, outlets, circuit breaker, fan, dead front plates, and fuse.

The mounting panel must be made of 3/4-inch-thick ACX-grade plywood.

The mounting panel must be fastened to the cabinet with nuts, lock washers, and flat washers to 10 welded studs.

The cabinet must be made of 0.125-inch-thick anodized aluminum.

The cabinet door must be hung and secured with drawn latches, lockable with a padlock. The padlock latches must each have a minimum 7/16-inch-diameter hole.

Ventilation louvers must be located on the door.

The fan must be located in a ventilator housing and be controlled thermostatically. The thermostat control must have a range from 80 to 130 degrees F.

The thermostat and fan circuit must be protected with a fuse rated for 175 percent of the motor capacity. The fan capacity must be a minimum 25 cfm.

86-1.02Q(4)(d) Type C Telephone Demarcation Cabinets

Reserved

86-1.02Q(5) Battery Backup System Cabinets

The cabinet for a battery backup system must comply with TEES and be on the Authorized Material List for traffic signal control equipment.

86-1.02R Signal Heads

86-1.02R(1) General

A signal head consists of a signal mounting assembly, backplate, and signal face.

The head must have a terminal block attached to the back of one housing. The terminal block must have enough positions to accommodate all indications. Each position must be permanently labeled for the indications used.

The metal signal heads must not fracture or deflect more than half the lens diameter when tested under California Test 666.

The plastic signal heads must not fracture or deflect when tested under California Test 605.

The deflection must not be more than 10 degrees in either the vertical or horizontal plane after the wind load has been removed from the front of the signal face or more than 6 degrees in either the vertical or horizontal plane after the wind load has been removed from the back of the signal face.

86-1.02R(2) Signal Mounting Assemblies

Signal mounting assembly must include:

1. 1-1/2-inch-diameter steel pipe or galvanized conduit
2. Pipe fitting made of ductile iron, galvanized steel, bronze, or aluminum alloy, Type AC-84B, no. 380
3. Mast arm and post-top slip fitters and terminal compartments made of cast bronze or hot-dip galvanized ductile iron

The horizontal distance between the vertical centerlines of the terminal compartment or slip fitter and of each signal face must not exceed 11 inches except where required for proper signal face alignment or to allow programming of programmed visibility signal sections.

The mounting assembly must be watertight and free of sharp edges or protrusions that might damage conductor insulation. The assembly must have positive-locking serrated fittings that prevent signal faces from rotating when the fittings are mated with similar fittings on the faces.

Each terminal compartment must be fitted with a terminal block having a minimum of 12 positions, each with 2 screw-type terminals. Each terminal must accommodate at least five no. 14 conductors. The terminal compartment must have a cover for easy access to the terminal block.

86-1.02R(3) Backplates

The backplate material must be a homogeneous black color with a lusterless finish.

A metal backplate must be made of a minimum 1/16-inch-thick 3001-14 aluminum.

A plastic backplate must have a minimum thickness of 1/16 inch and be formed from sheet plastic or assembled from extruded, molded, or cast plastic sections. Sections must be factory joined using one of the following:

1. Appropriate solvent cement.
2. Aluminum rivets and washers painted or permanently colored to match the backplate.
3. No. 10 machine screws with flat washers, lock washers, and nuts painted to match the backplate.

Each plastic backplate must be secured to the plastic signal face such that it resists removal or permanent deformation.

86-1.02R(4) Signal Faces

Signal face consists of signal sections with signal housings, LED modules, and visors.

Signal face must:

1. Be adjustable and allow for 360-degree rotation about the vertical axis
2. Comply with ITE publications ST-052-E, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement* and ST-054, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement*
3. Be sealed with a neoprene gasket at the top opening

A metal signal face must have a metal backplate and visor.

A plastic signal face must have a plastic backplate and visor.

If a signal face is supported by a Type MAS slip fitter, spacers are required between the 2 sections. The spacers must be made of the same material as the housing. The vertical dimension of the spacers must allow proper seating of the serrations between the slip fitter and the 2 sections. The 2 sections must be joined with at least two no. 10 minimum machine screws through holes near the front of the housing and the spacers and matching holes in a reinforcing plate installed in the housing.

86-1.02R(4)(a) Signal Sections

86-1.02R(4)(a)(i) General

Signal section must have:

1. Opening at the top and bottom for a 1-1/2-inch pipe
2. Maximum height of 10-1/4 inches for an 8-inch section and 14-3/4 inches for a 12-inch section
3. Hinge pins, door-latching devices, and other exposed hardware manufactured of Type 304/304L or 305 stainless steel
4. Interior screws and fittings manufactured of stainless steel or steel with a corrosion-resistant plating or coating
5. Gaskets made of a material that is not degraded if installed in a section with metal or plastic housing

Sections must be capable of being joined together to form a signal face in any combination. This interchangeability is not required between metal and plastic sections.

Each section must be joined to an adjacent section by one of the following:

1. Minimum of 3 machine screws for 8-inch sections and 4 machine screws for 12-inch sections, installed through holes near the front and back of the housing. Each screw must be a no. 10 and have a nut, flat washer, and lock washer.
2. 2 machine screws, each with a nut, flat washer, and lock washer, installed through holes near the front of the housing and a fastener through the 1-1/2-inch pipe opening. The fastener must have 2 large, flat washers to distribute the load around the pipe's opening and 3 carriage bolts, each with a nut and lock washer. The minimum screw size must be no. 10, and the carriage bolt size must be 1/4 inch.

The holes for the machine screws must be either cast or drilled during signal section fabrication. Each hole must be surrounded by a minimum 1/8-inch-wide boss to allow contact between signal sections about the axis of the hole.

A serrated nylon washer must be inserted between each plastic signal section and the metal mounting assembly. Each serrated nylon washer must be from 3/16 to 1/4 inch thick. The serrations must match those on the signal section and the mounting assembly.

86-1.02R(4)(a)(ii) Programmed Visibility Signal Sections

Programmed visibility signal section must have:

1. Nominal 12-inch-diameter circular or arrow indication
2. Cap visor
3. Adjustable connection that:
 - 3.1. Provides incremental tilting from 0 to 10 degrees above or below the horizontal

3.2. Maintains a common vertical axis through couplers and mountings

The terminal connection must allow external adjustment about the mounting axis in 5-degree increments.

The visibility of each signal section must be capable of adjustment or programming within the section.

The adjustment for the section must be preset at 4 degrees below the horizontal.

86-1.02R(4)(a)(iii) Signal Housings

The signal housing must:

1. Be die-cast aluminum, permanent mold-cast aluminum, or if specified, structural plastic
2. Comply with ITE publications ST-052-E, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement* and ST-054, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement* if made of die-cast or permanent mold-cast aluminum
3. Have a 1-piece, hinged, square-shaped door that is:
 - 3.1. Designed to allow access for replacement of modules without the use of tools
 - 3.2. Secured such that it remains closed during loading tests
4. Have a watertight module or lens mounted in the door
5. Have a terminal block attached to the back, with the terminals permanently labeled for conductors to facilitate field wiring

Each housing must have reinforcement plates. Reinforcement plates must be either sheet aluminum, galvanized steel, or cast aluminum. Each plate must have a minimum thickness of 0.11 inch and a hole concentric with a 1-1/2-inch pipe-mounting hole in the housing. Reinforcement plates must be placed as specified in the following table:

| Material | Placement |
|------------------|-------------------------------|
| Sheet aluminum | Inside and outside of housing |
| Galvanized steel | Inside of housing |
| Cast aluminum | Outside of housing |

Reinforcement plates placed outside of the housing must be finished to match the signal housing color and be designed to allow a proper serrated coupling between the signal face and the mounting hardware. A minimum of three no. 10 machine screws must be installed through holes in each plate and matching holes in the housing. Each screw must have a round or binder head, a nut, and a lock washer.

A metal housing must have a metal visor.

Plastic housing must:

1. Be molded in a single piece or fabricated from 2 or more pieces joined into a single piece
2. Be a black color throughout, including the door, matching color no. 17038, 27038, or 37038 of FED-STD-595
3. Have UV stability
4. Be self-extinguishing

If reinforcing webs are used to connect the back of the housing to the top, bottom, and sides of the adjacent housing, reinforcement plates are not required.

The exterior of the housing must be painted as specified in sections 78-4.08 and 59.

86-1.02R(4)(b) LED Signal Modules

An LED signal module must be on the Authorized Material List for LED traffic signal modules.

An LED signal module must comply with ITE publications ST-052-E, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement* and ST-054, *Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement*, except:

1. Maximum module weight must be 4 lb
2. Module must be a sealed unit with:
 - 2.1. 2 color-coded conductors for the power connection except lane control modules must use 3 color-coded conductors
 - 2.2. Printed circuit board that complies with TEES, chapter 1, section 6
 - 2.3. Lens that is:
 - 2.3.1. Convex or flat with a smooth outer surface
 - 2.3.2. Made of UV-stabilized plastic or glass
 - 2.4. 1-piece EPDM gasket
3. Module must include 3-foot-long conductors with attached quick-disconnect terminals
4. Identification must include:
 - 4.1. Month and year of manufacture
 - 4.2. 1-inch-diameter symbol of the module type with the module color written adjacent to the symbol in 0.50-inch-high letters
5. LED must be the ultra-bright type rated for 100,000 hours of continuous operation
6. Module must have an integral power supply

Individual LEDs must be wired such that a loss or failure of 1 LED will not result in a loss of more than 5 percent of the module's light output. Failure of an individual LED in a string must not result in a loss of an entire string or other indication.

The symbol for a 12-inch U-turn section must be a 15/16-inch-wide inverted *U* with an arrow on the left end.

A lane control section must be a combination module with a red *X* and green arrow. The conductor function and color code must be as shown in the following table:

Conductor Function and Color Code

| Function | Color |
|--------------|-------|
| Neutral | White |
| Red <i>X</i> | Red |
| Green arrow | Brown |

The minimum power consumption for an LED signal module must be 5 W.

The maximum power consumption for an LED signal module must be as shown in the following table:

Maximum Power Consumption

| LED signal module type | Power consumption (W) | | | | | |
|-------------------------------|-----------------------|-------|--------|-------|-------|-------|
| | Red | | Yellow | | Green | |
| | 25 °C | 74 °C | 25 °C | 74 °C | 25 °C | 74 °C |
| 8-inch circular | 8 | 13 | 13 | 16 | 12 | 12 |
| 12-inch circular | 11 | 17 | 22 | 25 | 15 | 15 |
| 12-inch arrow | 9 | 12 | 10 | 12 | 11 | 11 |
| 12-inch U-turn | 9 | 12 | 10 | 12 | 11 | 11 |
| Bicycle | 11 | 17 | 22 | 25 | 15 | 15 |
| Programmed visibility | 11 | 17 | 22 | 25 | 15 | 15 |
| Lane control (<i>X</i>) | 9 | 12 | -- | -- | -- | -- |
| Lane control (<i>Arrow</i>) | -- | -- | -- | -- | 11 | 11 |

Red and green LED signal modules operating over a temperature range from -40 to 74 degrees C and yellow LED signal modules operating at 25 degrees C must maintain the minimum illumination values for 48 months as shown in the following tables:

Minimum Maintained Intensities for Circular Indications

| Angle (v,h) | Intensities (cd) | | | | | |
|-------------|------------------|--------|-------|---------|--------|-------|
| | 8-inch | | | 12-inch | | |
| | Red | Yellow | Green | Red | Yellow | Green |
| 2.5, ±2.5 | 133 | 267 | 267 | 339 | 678 | 678 |
| 2.5, ±7.5 | 97 | 194 | 194 | 251 | 501 | 501 |
| 2.5, ±12.5 | 57 | 113 | 113 | 141 | 283 | 283 |
| 2.5, ±17.5 | 25 | 48 | 48 | 77 | 154 | 154 |
| 7.5, ±2.5 | 101 | 202 | 202 | 226 | 452 | 452 |
| 7.5, ±7.5 | 89 | 178 | 178 | 202 | 404 | 404 |
| 7.5, ±12.5 | 65 | 129 | 129 | 145 | 291 | 291 |
| 7.5, ±17.5 | 41 | 81 | 81 | 89 | 178 | 178 |
| 7.5, ±22.5 | 18 | 37 | 37 | 38 | 77 | 77 |
| 7.5, ±27.5 | 10 | 20 | 20 | 16 | 32 | 32 |
| 12.5, ±2.5 | 37 | 73 | 73 | 50 | 101 | 101 |
| 12.5, ±7.5 | 32 | 65 | 65 | 48 | 97 | 97 |
| 12.5, ±12.5 | 28 | 57 | 57 | 44 | 89 | 89 |
| 12.5, ±17.5 | 20 | 41 | 41 | 34 | 69 | 69 |
| 12.5, ±22.5 | 12 | 25 | 25 | 22 | 44 | 44 |
| 12.5, ±27.5 | 9 | 16 | 16 | 16 | 32 | 32 |
| 17.5, ±2.5 | 16 | 32 | 32 | 22 | 44 | 44 |
| 17.5, ±7.5 | 14 | 28 | 28 | 22 | 44 | 44 |
| 17.5, ±12.5 | 10 | 20 | 20 | 22 | 44 | 44 |
| 17.5, ±17.5 | 9 | 16 | 16 | 22 | 44 | 44 |
| 17.5, ±22.5 | 6 | 12 | 12 | 20 | 41 | 41 |
| 17.5, ±27.5 | 4 | 9 | 9 | 16 | 32 | 32 |

Minimum Maintained Luminance for Indications

| Indication type | Luminance (fL) | | |
|----------------------|----------------|--------|-------|
| | Red | Yellow | Green |
| Arrow | 1,610 | 3,210 | 3,210 |
| U-turn | 1,610 | 3,210 | 3,210 |
| Bicycle | 1,610 | 1,610 | 1,610 |
| Lane control (X) | 1,610 | -- | -- |
| Lane control (Arrow) | -- | -- | 1,610 |

Minimum Maintained Luminance for Programmed Visibility Indications

| Indication type | Luminance (cd) | | |
|---------------------------|----------------|--------|-------|
| | Red | Yellow | Green |
| PV at angle v=2.5, h=±2.5 | 314 | 314 | 314 |

Conductors must be prewired to the terminal block.

86-1.02R(4)(c) Visors and Directional Louvers

The visor must be a tunnel type.

The visor must have a downward tilt from 3 to 7 degrees with a minimum length of 9-1/2 inches for nominal 12-inch round lenses and 7 inches for nominal 8-inch round lenses.

A metal visor must be formed from minimum 0.050-inch-thick aluminum alloy sheet.

A plastic visor must be either formed from sheet plastic or blow-molded. The plastic must be a black homogeneous color with a lusterless finish. A visor must withstand a wind load applied to its side for 24 hours without permanent deformation or removal from its door when tested under California Test 605 for plastic visors and California Test 666 for metal visors.

If directional louvers are used, the louvers must fit into full-circular signal visors. Louvers must consist of one of the following:

1. Outside cylinder constructed of sheet steel with a minimum nominal thickness of 0.030 inch and vanes constructed of sheet steel with a minimum nominal thickness of 0.016 inch.
2. Outside cylinder and vanes constructed of 5052-H32 aluminum alloy of equal thickness.

86-1.02S Pedestrian Signal Heads

86-1.02S(1) General

A pedestrian signal head consists of a pedestrian signal mounting assembly and a pedestrian signal face comprising of a pedestrian signal housing, an LED countdown pedestrian signal face module, and a front screen.

86-1.02S(2) Pedestrian Signal Mounting Assemblies

A pedestrian signal mounting assembly must comply with the specifications for a signal mounting assembly in section 86-1.02R, except mast arm slip fitters are not required.

86-1.02S(3) Pedestrian Signal Faces

86-1.02S(3)(a) General

Each pedestrian signal face must include a light-duty terminal block rated at 5 A and have 12 positions with no. 6-by-1/8-inch binder head screws. Each position must have 1 screw-type terminal.

The wiring and terminal block must comply with ITE publication ST-055-E, *Pedestrian Traffic Control Signal Indicators: Light Emitting Diode (LED) Signal Modules*.

86-1.02S(3)(b) Pedestrian Signal Housings

Pedestrian signal housing must comply with the specifications for a signal housing in 86-1.02R(4)(a)(iii), except the maximum overall dimensions must be 18-1/2 inches wide, 19 inches high, and 11-1/2 inches deep and without:

1. Visor
2. Watertight module or lens mounted in the door
3. Reinforcement plates

The housing must have a terminal block attached to the back. The terminal block must have enough positions to accommodate all indications. Each position must be permanently labeled for the indications used.

86-1.02S(3)(c) LED Countdown Pedestrian Signal Face Modules

An LED countdown PSF module must comply with ITE publication ST-055-E, *Pedestrian Traffic Control Signal Indicators: Light Emitting Diode (LED) Signal Modules*, except the material must comply with ASTM D3935 and the module must have:

1. Ultra-bright-type LED rated for 100,000 hours of continuous operation.
2. Lot number and month and year of manufacture permanently marked on the back of the module
3. Prominent and permanent vertical markings for accurate indexing and orientation within the pedestrian signal housing if a specific mounting orientation is required. Markings must be a minimum of 1 inch in height and include an up arrow and the word *up* or *top*.
4. Circuit board complying with TEES, chapter 1, section 6.

Individual LEDs must be wired such that a loss or failure of 1 LED will not result in a loss of more than 5 percent of the module's light output. Failure of an individual LED in a string must not result in a loss of an entire string or other indication.

Each symbol must be at least 9 inches high and 5-1/4 inches wide. The 2-digit countdown timer, *Upraised Hand*, and *Walking Person* indications must be electronically isolated from each other. The 3 indications must not share a power supply or interconnect circuitry.

The module must operate over the specified ambient temperature and voltage range and be readable both day and night at distances up to the full width of the area to be crossed. Upon initial testing at 25 degrees C, the module must have at least the luminance values shown in the following table:

| Luminance Values | |
|------------------------------------------------|-----------|
| PSF module symbol | Luminance |
| Upraised hand and 2-digit countdown timer (fL) | 1,094 |
| Walking person (fL) | 1,547 |

The module must not exceed the power consumption requirements shown in the following table:

| Maximum Power Consumption Requirements | | |
|-----------------------------------------------|----------|----------|
| PSF module display | At 24 °C | At 74 °C |
| <i>Upraised Hand</i> | 10.0 W | 12.0 W |
| <i>Walking Person</i> | 9.0 W | 12.0 W |
| 2-digit countdown timer | 6.0 W | 8.0 W |

86-1.02S(3)(d) Front Screen

Pedestrian signal face must have a front screen that is one of the following types:

1. 3/8-inch-thick aluminum honeycomb screen with 0.2-inch-wide cells or a 1/2-inch-thick plastic screen with 3/8-inch-wide squares with 1/16-inch wall thickness that:
 - 1.1. Is installed so it tilts downward at an angle of 15 ± 2 degrees from the top and completely covers the message plate.
 - 1.2. Includes a clear front cover made of either a minimum 1/8-inch-thick acrylic plastic sheet or a minimum 1/16-inch-thick polycarbonate plastic.
 - 1.3. Is held firmly in place, including the cover, with stainless steel or aluminum clips or stainless steel metal screws.
2. Polycarbonate screen that:
 - 2.1. Has a nominal thickness of 1/32 inch.
 - 2.2. Is a 1-1/2-inch-deep eggcrate or Z-crate type.
 - 2.3. Is mounted in a frame constructed of aluminum alloy or polycarbonate with a minimum thickness of 0.040 inch.
 - 2.4. Is held in place with stainless steel screws.

The screen and frame of a pedestrian signal face must be made of either (1) plastic that is a flat black color or (2) anodized aluminum that is a flat black color or finished with lusterless, black, exterior-grade latex paint formulated for application to metal surfaces.

86-1.02T Accessible Pedestrian Signals

Accessible pedestrian signal must comply with the *California MUTCD*, chapter 4E, and have:

1. Audible speech message that plays when the push button is actuated. The message must include the name of the street to be crossed. The accessible pedestrian signal must have at least 5 audible message options.
2. Push button locator tone that clicks or beeps.
3. Feature that activates the pedestrian phase during a failure of the audible message, locator tone, or vibrotactile device.

An accessible pedestrian signal must function with the Department-furnished Model 170E/2070E controller assembly.

No part of the accessible pedestrian signal must be installed inside the controller cabinet. Power for the accessible pedestrian signal must be from the pedestrian signal housing terminal block.

The housing for the signal assembly must be made of corrosion-resistant material. Theft-proof bolts used for mounting the housing to the standard must be stainless steel with a content of 17 percent chromium and 8 percent nickel. The housing must be shaped to fit the pole's curvature.

The color of a metallic housing must match color no. 33538 of FED-STD-595.

The color of a plastic housing must match color no. 17038, 27038, or 37038 of FED-STD-595.

Accessible pedestrian signal must:

1. Have electronic switches, a potentiometer, or an access port for a device for controlling and programming the volume level and messaging
2. Be weatherproof and shockproof

Enclosure for the accessible pedestrian signal must:

1. Weigh less than 7 lb
2. Measure less than 16 by 6 by 5 inches
3. Have a wiring hole with a diameter not exceeding 1-1/8 inches
5. Have a switch for a push button
6. Have a vibrotactile device on the push button or on the arrow
7. Have an internal weatherproof speaker and microphone that senses the ambient sound level

The separation between adjacent holes used for conductors and mounting must be at least twice the diameter of the larger hole.

The speaker grills must be located on the surface of the enclosure. The speakers must not interfere with the housing or its mounting hardware.

The conductor cable between the accessible pedestrian signal assembly and the pedestrian signal head must be a 9 no. 20 conductor cable complying with MIL-W-16878D.

86-1.02U Push Button Assemblies

The housing for a push button assembly must be made of die-cast aluminum, permanent mold-cast aluminum, or UV-stabilized self-extinguishing structural plastic. The plastic housing must have a color throughout that matches color no. 17038, 27038, or 37038 of FED-STD-595.

If the push button is to be attached to a pole, the housing must be shaped to fit the pole's curvature.

The assembly must be waterproof and shockproof.

The push button's switch must be a single-pole, double-throw switching unit with screw-type terminals rated 15 A at 125 V(ac).

Switch for the push button must have:

1. Plunger actuator and a U frame to allow recessed mounting in the push button housing
2. Operating force of 3.5 lb
3. Maximum pretravel of 5/64 inch
4. Minimum overtravel of 1/32 inch
5. Differential travel from 0.002 to 0.04 inch
6. Minimum 2-inch diameter actuator

86-1.02V Reserved

86-1.02W Loop Detector Sealants

86-1.02W(1) General

Sealant for filling loop detector slots must be one of the following:

1. Asphaltic emulsion
2. Elastomeric sealant
3. Epoxy sealant for inductive loops
4. Hot-melt rubberized asphalt

86-1.02W(2) Asphaltic Emulsion Sealant

Asphaltic emulsion sealant must comply with the State Specification 8040-41A-15.

86-1.02W(3) Elastomeric Sealant

Elastomeric sealant must be a polyurethane material that cures only in the presence of moisture if used within the stated shelf life. The sealant must be suitable for use in both asphalt concrete and concrete pavement.

The cured elastomeric sealant must comply with the requirements shown in the following table:

Cured Elastomeric Sealant Requirements

| Quality characteristic | Test method | Requirement |
|-----------------------------|-------------------------|-----------------|
| Hardness | ASTM D2240 ^a | 65–85 |
| Tensile strength (min, MPa) | ASTM D412 ^b | 3.45 |
| Elongation (min, %) | | 400 |
| Flex at -40 °C ^c | -- | No cracks |
| Weathering resistance | ASTM D822 ^d | Slight chalking |
| Salt spray resistance: | ASTM B117 ^e | |
| Tensile strength (min, MPa) | | 3.45 |
| Elongation (min, %) | | 400 |
| Dielectric constant (%) | ASTM D150 ^f | <25 |

^aIndentation at 25 °C and 50% relative humidity (Rex. Type A, Model 1700 only)

^bDie C pulled at 508 mm/minute

^c0.6-mm free film bend (180°) over 13-mm mandrel

^dWeatherometer 350 h, cured 7 days at 25 °C and 50% relative humidity

^e28 days at 38 °C with 5% NaCl, Die C, and pulled at 508 mm/minute)

^fChange over a temperature range from -30 to 50 °C

86-1.02W(4) Hot-Melt Rubberized Asphalt Sealant

Hot-melt rubberized asphalt sealant must:

1. Be in solid form at room temperature and fluid at an application temperature range from 190 to 205 degrees C
2. Not produce toxic fumes
3. Be suitable for use in both asphalt concrete and concrete pavement
4. Be packaged in containers clearly marked *Detector Loop Sealant* with the manufacturer's batch and lot number.

The cured hot-melt rubberized asphalt sealant must comply with the requirements shown in the following table:

Cured Hot-Melt Rubberized Asphalt Sealant Requirements

| Quality characteristic | Test method | Requirement |
|-------------------------------------------|----------------------------------|-------------|
| Cone penetration (max, 1/10 mm) | ASTM D5329, sec. 6 ^a | 35 |
| Flow (max, mm) | ASTM D5329, sec. 8 ^b | 5 |
| Resilience (min, %) | ASTM D5329, sec. 12 ^c | 25 |
| Softening point (min, °C) | ASTM D36 | 82 |
| Ductility (min, cm) | ASTM D113 ^d | 30 |
| Flash point, Cleveland Open Cup (min, °C) | ASTM D92 | 288 |
| Viscosity (Pa·s) | ASTM D4402 ^e | 2.5–3.5 |

^aAt 25 °C, 150 g, 5 s

^bAt 60 °C

^cAt 25 °C

^dAt 25 °C, 5 cm/minute

^eBrookfield Thermosel, no. 27 spindle, 20 rpm, 190 °C

86-1.02X Reserved

86-1.02Y Transformers

A transformer must be single-phase and may be a nonsubmersible or submersible type.

A transformer must be a dry type designed for operation on a 60 Hz supply. The transformer must have a decal showing a connection diagram. The diagram must show either color coding or wire tagging with primary (H1, H2) or secondary (X1, X2) markers and the primary and secondary voltage and volt-ampere rating. A transformer must comply with the electrical requirements shown in the following table:

Transformer Electrical Requirements

| Quality characteristic | Requirement |
|----------------------------------------------------------------------------|---------------------------------------|
| Rating (V(ac)) | 120/480, 120/240, 240/480, or 480/120 |
| Efficiency (%) | > 95 |
| Secondary voltage regulation and tolerance from half load to full load (%) | ±3 |

Secondary 240 and 480 V(ac) windings must be center tapped.

The transformer must withstand the application of 2,200 V(ac) from core to coils and from coil to coil for a 1-minute period when tested immediately after operation of the transformer at full load for 24 hours.

The external leads for the secondary connections must be no. 10 Type USE rated for 600 V(ac).

The transformer's leads must extend a minimum of 12 inches from the case.

The transformer's insulation must be NEMA 185 C or better.

Each transformer must:

Greenstone Rd at Slate Creek Bridge Replacement
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 March 5, 2019

County of El Dorado
Revised Standard Specifications
 AA-159

1. Include metal half-shell coil protection.
2. Have moisture-resistant, synthetic-varnish-impregnated windings.
3. Be waterproof and suitable for outdoor operation.

Each submersible transformer must:

1. Include a handle and a hanger.
2. Be securely encased in a rugged, corrosion-resistant, watertight case.
3. Have leads that extend out through 1 or more sealed hubs.
4. Be manufactured to withstand a 5-day test with 12-hour on and off periods submerged in 2 feet of salt water that is 2 percent salt by weight. The operating periods must be at full load.

86-1.02Z Batteries

Battery must:

1. Be deep-cycle, sealed, prismatic, lead-calcium-based, absorbed-glass-mat, valve-regulated, lead-acid type
2. Be rated for 12 V
3. Be rated for a temperature range from -25 to 60 degrees C
4. Be group size 24
5. Be commercially available and stocked locally
6. Be marked with a date code, maximum recharge data, and recharge cycles
7. Be new and fully charged when furnished
8. Be free from damage or deformities
9. Have a carrying handle
10. Have 2 top-mounted, threaded-stud posts that include all washers and nuts
11. Include insulating rubber covers for protecting the lugs, posts, and wiring: red for the positive terminal and black for the negative terminal

If a battery is used for a battery backup system, it must accommodate 3/8-inch ring lugs of a Department-furnished battery harness.

86-1.03 CONSTRUCTION

Not Used

86-1.04 PAYMENT

Not Used

Replace section 87 with:

04-15-16

87 ELECTRICAL SYSTEMS

04-15-16

87-1 GENERAL

87-1.01 GENERAL

87-1.01A Summary

Section 87 includes general specifications for constructing and installing electrical systems.

The Department deducts the cost for maintenance performed by the Department on new or portions of existing systems modified under the Contract.

87-1.01B Definitions

Reserved

87-1.01C Submittals

Reserved

87-1.01D Quality Assurance

87-1.01D(1) General

Reserved

87-1.01D(2) Quality Control

Before shipping the material to the job site, submit to METS test samples of:

1. Accessible pedestrian signals
2. LED countdown pedestrian signal face modules
3. LED signal modules
4. LED luminaires

Submit a sample size as shown in the following table:

Electrical Material Sampling

| Contract quantity | Test sample size |
|-------------------|------------------|
| 1–8 | 1 |
| 9–15 | 2 |
| 16–25 | 3 |
| 26–90 | 5 |
| 91–150 | 8 |
| 151–280 | 13 |
| 281–500 | 20 |
| 501–1200 | 32 |

Before starting operation of an electrical system, perform a conductor test in the presence of the Engineer.

Conductor test consists of testing each conductor and the conductors in cables for:

1. Continuity.
2. Grounds.
3. Insulation resistance at 500 V(dc) between the circuit and ground. The insulation resistance must be a minimum of 10 MΩ on circuits, except it must be a minimum of 100 MΩ for inductive loop detector circuits.

Start the operational test of the system on any day except Friday or the day before a holiday. The operational test for signals must start from 9:00 a.m. to 2:00 p.m. Notify the Engineer 48 hours before starting the test.

An operational test consists of a minimum of 5 business days of continuous, satisfactory operation of the system. If the system fails, correct the problem and retest the system. A shutdown of the system caused by traffic, a power interruption, or unsatisfactory performance of Department-furnished materials does not constitute discontinuity of the test.

87-1.02 MATERIALS

Not Used

87-1.03 CONSTRUCTION

87-1.03A General

The Engineer determines the final locations of electrical systems.

Verify the locations of electrical systems and the depths of existing detectors, conduits, and pull boxes.

Notify the Engineer before performing work on the existing system.

You may shut down the system for alteration or removal.

Where an existing Department underground facility is shown within 10 feet of any excavation, locate and field mark the facility before performing work that could damage or interfere with the existing facility.

If an existing facility is within 2 feet of an excavation, determine the exact location of the facility by excavating with hand tools before using any power-operated or power-driven excavating or boring equipment. A vacuum excavator may be used if authorized.

Notify the Engineer immediately if an existing facility is damaged by your activities.

If existing underground conduit is to be incorporated into a new system, clean it with a mandrel or cylindrical wire brush and blow it clean with compressed air.

Limit the shutdown of traffic signal systems to normal working hours. Notify the local traffic enforcement agency before shutting down the signal.

Place temporary W3-1 and R1-1 signs in each direction to direct traffic through the intersection during shutdown of the signal. Place two R1-1 signs for 2-lane approaches. The signs must comply with part 2 of the *California MUTCD*.

Cover signal faces when the system is shut down overnight. Cover temporary W3-1 and R1-1 signs when the system is turned on.

If you work on an existing lighting system and the roadway is to remain open to traffic, ensure the system is in operation by nightfall.

Replace detectors you damage within 72 hours, or the Department replaces them and deducts the cost.

Work performed on an existing system not described is change order work.

Do not use electrical power from existing highway facilities unless authorized.

Maintain a minimum 48-inch clearance for a pedestrian pathway when placing equipment.

Except for service installation or work on service equipment enclosures, do not work above ground until all materials are on hand to complete the electrical work at each location.

Bond all metal components to form a continuous grounded system as specified in NEC.

Ground metallic equipment mounted less than 8 feet above the ground surface on a wood pole.

If you damage any portion of a concrete curb, sidewalk, curb ramp, driveway, or gutter depression, replace the entire section between contraction or expansion joints under section 73.

Apply equipment identification characters.

Orient louvers, visors, and signal faces such that they are clearly visible to approaching traffic from the direction being controlled.

Test loops and the detector lead-in cable circuit for continuity, ground, and insulation resistance at the controller cabinet before connecting detector lead-in cable to the terminal block.

Perform an operational test of the systems.

Before starting the operational test for systems that impact traffic, the system must be ready for operation, and all signs, pavement delineation, and pavement markings must be in place at that location.

87-1.03B Conduit Installation

87-1.03B(1) General

The installation of conduit includes installing caps, bushings, and pull tape and terminating the conduit in pull boxes, foundations, poles, or a structure.

Limit the number of bends in a conduit run to no more than 360 degrees between pull points.

Use conduit to enclose conductors except where they are installed overhead or inside standards or posts.

You may use a larger size conduit than specified for the entire length between termination points. Do not use a reducing coupling.

Extend an existing conduit using the same material. Terminate conduits of different materials in a pull box.

Install 2 conduits between a controller cabinet and the adjacent pull box.

Use a minimum trade size of conduit of:

1. 1-1/2 inches from an electrolier to the adjacent pull box
2. 1 inch from a pedestrian push button post to the adjacent pull box
3. 2 inches from a signal standard to the adjacent pull box
4. 3 inches from a controller cabinet to the adjacent pull box
5. 2 inches from an overhead sign to the adjacent pull box
6. 2 inches from a service equipment enclosure to the adjacent pull box
7. 1-1/2 inches if unspecified

Use Type 1 conduit:

1. On all exposed surfaces
2. In concrete structures
3. Between a structure and the nearest pull box

Ream the ends of shop-cut and field-cut conduit to remove burrs and rough edges. Make the cuts square and true. Do not use slip joints and running threads to couple conduit. If a standard coupling cannot be used for metal-type conduit, use a threaded union coupling. Tighten the couplings for metal conduit to maintain a good electrical connection.

Cap the ends of conduit to prevent debris from entering before installing the conductors or cables. Use a plastic cap for Type 1, 2, and 5 conduits and a standard pipe cap for all other types of conduit.

For Type 1, 2, and 5 conduits, use threaded bushings and bond them using a jumper. For other types of conduit, use nonmetallic bushings.

Do not install new conduit through foundations.

Cut Type 2 conduit with pipe cutters; do not use hacksaws. Use standard conduit-threading dies for threading conduit. Tighten conduit into couplings or fittings using strap wrenches or approved groove joint pliers.

Cut Type 3 conduit with tools that do not deform the conduit. Use a solvent weld for connections.

Protect shop-cut threads from corrosion under the standards shown in the following table:

| Shop-Cut Thread Corrosion Protection | |
|---------------------------------------------|------------|
| Conduit | Standard |
| Types 1 and 2 | ANSI C80.1 |
| Type 5 | ANSI C80.6 |

Apply 2 coats of unthinned, organic zinc-rich primer to metal conduit before painting. Use a primer on the Authorized Material List for organic zinc-rich primers. Do not use aerosol cans. Do not remove shop-installed conduit couplings.

For conduits, paint:

1. All exposed threads
2. Field-cut threads, before installing conduit couplings to metal conduit
3. Damaged surfaces on metal conduit

If a Type 2 conduit or conduit coupling coating is damaged:

1. Clean the conduit or fitting and paint it with 1 coat of rubber-resin-based adhesive under the manufacturer's instructions
2. Wrap the damaged coating with at least 1 layer of 2-inch-wide, 20 mils-minimum-thickness, PVC tape under ASTM D1000 with a minimum tape overlap of 1/2 inch

You may repair damaged spots of 1/4 inch or less in diameter in the thermoplastic coating by painting with a brushing-type compound supplied by the conduit manufacturer.

If factory bends are not used, bend the conduit to a radius no less than 6 times its inside diameter without crimping or flattening it. Comply with the bending requirements shown in the following table:

| Conduit-Bending Requirements | |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Type | Requirement |
| 1 | Use equipment and methods under the conduit manufacturer's instructions. |
| 2 | Use a standard bending tool designed for use on thermoplastic-coated conduit. The conduit must be free of burrs and pits. |
| 3 | Use equipment and methods under the conduit manufacturer's instructions. Do not expose the conduit to a direct flame. |
| 5 | Use equipment and methods under the conduit manufacturer's instructions. |

Install pull tape with at least 2 feet of slack in each end of the conduit that will remain empty. Attach the tape's ends to the conduit.

Install conduit terminating in a standard or pedestal from 2 to 3 inches above the foundation. Slope the conduit toward the handhole opening.

Terminate conduit installed through the bottom of a nonmetallic pull box 2 inches above the bottom and 2 inches from the wall closest to the direction of the run.

87-1.03B(2) Conduit Installation for Structures

87-1.03B(2)(a) General

Paint exposed Type 1 conduit the same color as the structure.

Install galvanized steel hangers, steel brackets, and other fittings to support conduit in or on a wall or bridge.

87-1.03B(2)(b) New Structures

Seal and make watertight the conduits which lead to soffits, wall-mounted luminaires, other lights, and fixtures located below the pull box grade.

If you place a conduit through the side of a nonmetallic pull box, terminate the conduit 2 inches from the wall and 2 inches above the bottom. Slope the conduit toward the top of the box to facilitate pulling conductors.

For ease of installation and if authorized, you may use Type 4 conduit instead of Type 1 conduit for the final 2 feet of conduit entering a pull box in a reinforced concrete structure.

Install an expansion fitting where a conduit crosses an expansion joint in a structure. Each expansion fitting for metal conduit must include a copper bonding jumper having the ampacity as specified in NEC.

Install an expansion-deflection fitting for an expansion joint with a 1-1/2-inch movement rating. The fitting must be watertight and include a molded neoprene sleeve, a bonding jumper, and 2 silicon bronze or zinc-plated iron hubs.

For an expansion joint with a movement rating greater than 1-1/2 inches, install the expansion-deflection fitting as shown.

For conduit installed inside of bridge structures, you must:

1. Install precast concrete cradles made of minor concrete and commercial-quality welded wire fabric. The minor concrete must contain a minimum of 590 lb of cementitious material per cubic yard. The cradles must be moist cured for a minimum of 3 days.
2. Bond precast concrete cradles to a wall or bridge superstructure with one of the following:
 - 2.1. Epoxy adhesive for bonding freshly-mixed concrete to hardened concrete.
 - 2.2. Rapid-set epoxy adhesive for pavement markers.
 - 2.3. Standard-set epoxy adhesive for pavement markers.
3. Use a pipe sleeve or form an opening for a conduit through a bridge superstructure. The sleeve or opening through a prestressed member or conventionally reinforced precast member must be:
 - 3.1. Oriented transverse to the member.
 - 3.2. Located through the web.
 - 3.3. No more than 4 inches in size.
4. Wrap the conduit with 2 layers of asphalt felt building paper and securely tape or wire the paper in place for a conduit passing through a bridge abutment wall. Fill the space around the conduit with mortar under section 51-1, except the proportion of cementitious material to sand must be 1 to 3. Fill the space around the conduits after prestressing is completed.

Thread and cap a conduit installed for future use in structures. Mark the location of the conduit's end in a structure, curb, or wall directly above the conduit with a Y that is 3 inches tall.

87-1.03B(2)(c) Existing Structures

Run surface-mounted conduit straight and true, horizontal or vertical on the wall, and parallel to walls on ceilings or similar surfaces. Support the conduit at a maximum of 5-foot intervals where needed to prevent vibration or deflection. Support the conduit using galvanized, malleable-iron, conduit clamps, and clamp backs secured with expansion anchorage devices complying with section 75-3.02C. Use the largest diameter of galvanized, threaded studs that will pass through the mounting hole in the conduit clamp.

87-1.03B(3) Conduit Installation Underground

87-1.03B(3)(a) General

Install conduit to a depth of:

1. 14 inches for the trench-in-pavement method
2. 18 inches, minimum, under sidewalk and curbed paved median areas

3. 42 inches, minimum, below the bottom of the rail of railroad tracks
4. 30 inches, minimum, everywhere else below grade

Place conduit couplings at a minimum of 6 inches from the face of a foundation.

Place a minimum of 2 inches of sand bedding in a trench before installing Type 2 or Type 3 conduit and 4 inches of sand bedding over the conduit before placing additional backfill material.

If installing conduit within the limits of hazardous locations as specified in NEC for Class I, division 1, install and seal Type 1 or Type 2 conduit with explosion-proof sealing fittings.

87-1.03B(3)(b) Conduit Installation under Paved Surfaces

You may lay conduit on existing pavement within a new curbed median constructed on top.

Install conduit under existing pavement by the jacking or drilling methods. You may use the trench-in-pavement method for either of the following conditions:

1. If conduit is to be installed behind the curb under the sidewalk
2. If the delay to vehicles will be less than 5 minutes

Do not use the trench-in-pavement method for conduit installations under freeway lanes or freeway-to-freeway connector ramps.

87-1.03B(3)(c) Reserved

87-1.03B(3)(d) Conduit Installation under Railroad Tracks

Install Type 1 or Type 2 conduit with a minimum diameter of 1-1/2 inches under railroad tracks. If you use the jacking or drilling method to install the conduit, construct the jacking pit a minimum of 13 feet from the tracks' centerline at the near side of the pit. Cover the jacking pit with planking if left overnight.

87-1.03B(4) Reserved

87-1.03B(5) Conduit Installation by the Jacking or Drilling Method

Keep the jacking or drilling pit 2 feet away from the pavement's edge. Do not weaken the pavement or soften the subgrade with excessive use of water.

If an obstruction is encountered, obtain authorization to cut small holes in the pavement to locate or remove the obstruction.

You may install Type 2 or Type 3 conduit under the pavement if a hole larger than the conduit's diameter is predrilled. The predrilled hole must be less than one and half the conduit's diameter.

Remove the conduit used for drilling or jacking and install new conduit for the completed work.

87-1.03B(6) Conduit Installation by the Trenching-In-Pavement Method

Install conduit by the trenching-in-pavement method using a trench approximately 2 inches wider than the conduit's outside diameter but not exceeding 6 inches in width.

Where additional pavement is to be placed, you must complete the trenching before the final pavement layer is applied.

If the conduit shown is to be installed under the sidewalk, you may install it in the street within 3 feet of and parallel to the face of the curb. Install pull boxes behind the curb.

Cut the trench using a rock-cutting excavator. Minimize the shatter outside the removal area of the trench.

Dig the trench by hand to the required depth at pull boxes.

Place conduit in the trench.

Backfill the trench with minor concrete to the pavement's surface by the end of each work day. If the trench is in asphalt concrete pavement and no additional pavement is to be placed, backfill the top 0.10 foot of the trench with minor HMA within 3 days after trenching.

87-1.03C Installation of Pull Boxes

87-1.03C(1) General

Install pull boxes no more than 200 feet apart.

You may install larger pull boxes than specified or shown and additional pull boxes to facilitate the work except in structures.

Install a pull box on a bed of crushed rock and grout it before installing conductors. The grout must be from 0.5 to 1 inch thick and sloped toward the drain hole. Place a layer of roofing paper between the grout and the crushed rock sump. Make a 1-inch drain hole through the grout at the center of the pull box.

Set the pull box such that the top is 1-1/4 inches above the surrounding grade in unpaved areas and leveled with the finished grade in sidewalks and other paved areas.

Place the cover on the box when not working in it.

Grout around conduits that are installed through the sides of the pull box.

Bond and ground the metallic conduit before installing conductors and cables in the conduit.

Bond metallic conduits in a nonmetallic pull box using bonding bushings and bonding jumpers.

Do not install pull boxes in concrete pads, curb ramps, or driveways.

Reconstruct the sump of a pull box if disturbed by your activities. If the sump was grouted, remove and replace the grout.

87-1.03C(2) Nontraffic Pull Boxes

If you bury a nontraffic pull box, set the box such that the top is 6 to 8 inches below the surrounding grade. Place a 20-mil-thick plastic sheet made of HDPE or PVC virgin compounds to prevent water from entering the box.

Place mortar between a nontraffic pull box and a pull box extension.

Where a nontraffic pull box is in the vicinity of curb in an unpaved area, place the box adjacent to the back of the curb if practical.

Where a nontraffic pull box is adjacent to a post or standard, place the box within 5 feet upstream from traffic if practical.

If you replace the cover on a nontraffic pull box, anchor it to the box.

87-1.03C(3) Traffic Pull Boxes

Place minor concrete around and under a traffic pull box.

Bolt the steel cover to the box when not working in it.

Bond the steel cover to the conduit with a jumper and bolt it down after installing the conductors and cables.

87-1.03C(4) Structure Pull Boxes

Bond metallic conduit in a metal pull box in a structure using locknuts, inside and outside of the box, bonding bushings, and bonding jumpers connected to bonding wire running in the conduit system.

87-1.03D Reserved

87-1.03E Excavating and Backfilling for Electrical Systems

87-1.03E(1) General

Notify the Engineer at least 72 hours before starting excavation activities.

Dispose of surplus excavated material.

Restrict closures for excavation on a street or highway to 1 lane at a time unless otherwise specified.

87-1.03E(2) Trenching

Dig a trench for the electrical conduits or direct burial cables. Do not excavate until the conduit or direct burial cable will be installed.

Place excavated material in a location that will not interfere with traffic or surface drainage.

After placing the conduit or direct burial cable, backfill the trench with the excavated material. Compact the backfill placed outside the hinge point of slopes and not under pavement to a minimum relative compaction of 90 percent.

Compact the backfill placed within the hinge points and in areas where pavement is to be constructed to a minimum relative compaction of 95 percent.

Restore the sidewalks, pavement, and landscaping at a location before starting excavation at another location.

87-1.03E(3) Concrete Pads, Foundations, and Pedestals

Construct foundations for standards, poles, metal pedestals, and posts under section 56-3.

Construct concrete pads, foundations, and pedestals for controller cabinets, telephone demarcation cabinets, and service equipment enclosures on firm ground.

Install anchor bolts using a template to provide proper spacing and alignment. Moisten the forms and ground before placing the concrete. Keep the forms in place until the concrete sets for at least 24 hours to prevent damage to the surface.

Use minor concrete for pads, foundations, and pedestals.

In unpaved areas, place the top of the foundation 6 inches above the surrounding grade, except place the top:

1. 1 foot 6 inches above the grade for Type M and 336L cabinets
2. 1 foot 8 inches above the grade for Type C telephone demarcation cabinets
3. 2 inches above the grade for Type G and Type A cabinets and Type III service equipment enclosures

The pad must be 2 inches above the surrounding grade.

In and adjacent to the sidewalk and other paved areas, place the top of the foundation 4 inches above the surrounding grade, except place the top:

1. 1 foot 6 inches above the grade for Type M and 336L cabinets
2. 1 foot 8 inches above the grade for Type C telephone demarcation cabinets
3. Level with the finished grade for Type G and Type A cabinets and Type III service equipment enclosures

The pad must be level with the finished grade.

Apply an ordinary surface finish under section 51-1.03F.

Allow the foundation to cure for at least 7 days before installing any equipment.

87-1.03F Conductors and Cable Installations

87-1.03F(1) General

The installation of conductors and cables includes splicing conductors and attaching the terminals and connectors to the conductors.

Clean the conduit and pull all conductors and cables as a unit.

If new conductors or cables are to be added in an existing conduit:

1. Remove the content
2. Clean the conduit
3. Pull both old and new conductors and cables as a unit

Wrap conductors and secure cables to the end of the conduit in a pull box.

Seal the ends of conduits with a sealing compound after installing conductors or cables.

Neatly arrange conductors and cables inside pull boxes and cabinets. Tie the conductors and cables together with self-clinching nylon cable ties or enclose them in a plastic tubing or raceway.

Identify conductors and cables by direct labeling, tags, or bands fastened in such a way that they will not move. Use mechanical methods for labeling.

Provide band symbol identification on each conductor or each group of conductors comprising a signal phase in each pull box and near the end of terminated conductors.

Tape the ends of unused conductors and cables in pull boxes to form a watertight seal.

Do not connect the push-button or accessible pedestrian signal neutral conductor to the signal neutral conductor.

87-1.03F(2) Cables

87-1.03F(2)(a) General

Reserved

87-1.03F(2)(b) Reserved

87-1.03F(2)(c) Copper Cables

87-1.03F(2)(c)(i) General

Reserved

87-1.03F(2)(c)(ii) Detector Lead-in Cables

Install a Type B or C detector lead-in cable in conduit.

Waterproof the ends of the lead-in cable before installing it in the conduit to prevent moisture from entering the cable.

Splice loop conductors for each direction of travel for the same phase, terminating in the same pull box, to a separate lead-in cable running from the pull box adjacent to the loop detector to a sensor unit mounted in the controller cabinet. Install the lead-in cable without splices except at the pull box.

Verify in the presence of the Engineer that the loops are operational before making the final splices between loop conductors and the lead-in cable.

Identify and tag each lead-in cable with the detector designation at the cabinet and pull box adjacent to the loops.

87-1.03F(2)(c)(iii) Conductors Signal Cables

Do not splice signal cables except for a 28-conductor cable.

Provide identification at the ends of terminated conductors in a cable as shown.

Provide identification for each cable in each pull box showing the signal standard to which it is connected except for the 28-conductor cable.

Connect conductors in a 12-conductor cable as shown in the following table:

| Color code | Termination | Phase |
|---------------------|--------------------------------------------------|---------------|
| Red | Red signal | 2, 4, 6, or 8 |
| Yellow | Yellow signal | 2, 4, 6, or 8 |
| Brown | Green signal | 2, 4, 6, or 8 |
| Red/black stripe | Red signal | 1, 3, 5, or 7 |
| Yellow/black stripe | Yellow signal | 1, 3, 5, or 7 |
| Brown/black stripe | Green signal | 1, 3, 5, or 7 |
| Black/red stripe | Spare or as required for red or <i>DONT WALK</i> | -- |
| Black/white stripe | Spare or as required for yellow | -- |
| Black | Spare or as required for green or <i>WALK</i> | -- |
| Red/white stripe | Pedestrian signal <i>DONT WALK</i> | -- |
| Brown/white stripe | Pedestrian signal <i>WALK</i> | -- |
| White | Terminal block | Neutral |

Provide identification for each 28-conductor cable C1 or C2 in each pull box. The cable labeled C1 must be used for signal phases 1, 2, 3, and 4. The cable labeled C2 must be used for signal phases 5, 6, 7, and 8.

Connect conductors in a 28-conductor cable as shown in the following table:

28CSC Color Code and Functional Connection

| Color code | Termination | Phase |
|------------------------|------------------------------------|----------------------------------------|
| Red/black stripe | Red signal | 2 or 6 |
| Yellow/black stripe | Yellow signal | 2 or 6 |
| Brown/black stripe | Green signal | 2 or 6 |
| Red/orange stripe | Red signal | 4 or 8 |
| Yellow/orange stripe | Yellow signal | 4 or 8 |
| Brown/orange stripe | Green signal | 4 or 8 |
| Red/silver stripe | Red signal | 1 or 5 |
| Yellow/silver stripe | Yellow signal | 1 or 5 |
| Brown/silver stripe | Green signal | 1 or 5 |
| Red/purple stripe | Red signal | 3 or 7 |
| Yellow/purple stripe | Yellow signal | 3 or 7 |
| Brown/purple stripe | Green signal | 3 or 7 |
| Red/2 black stripes | Pedestrian signal <i>DONT WALK</i> | 2 or 6 |
| Brown/2 black stripes | Pedestrian signal <i>WALK</i> | 2 or 6 |
| Red/2 orange stripes | Pedestrian signal <i>DONT WALK</i> | 4 or 8 |
| Brown/2 orange stripes | Pedestrian signal <i>WALK</i> | 4 or 8 |
| Red/2 silver stripes | Overlap A, C | OLA ^a , OLC ^a |
| Brown/2 silver stripes | Overlap A, C | OLA ^c , OLC ^c |
| Red/2 purple stripes | Overlap B, D | OLB ^a , OLD ^a |
| Brown/2 purple stripes | Overlap B, D | OLB ^c , OLD ^c |
| Blue/black stripe | Pedestrian push button | 2 or 6 |
| Blue/orange stripe | Pedestrian push button | 4 or 8 |
| Blue/silver stripe | Overlap A, C | OLA ^b , OLC ^b |
| Blue/purple stripe | Overlap B, D | OLB ^b , OLD ^b |
| White/black stripe | Pedestrian push button common | -- |
| Black/red stripe | Railroad preemption | -- |
| Black | Spare | -- |
| White | Terminal block | Neutral |

OL = Overlap; A, B, C, and D = Overlapping phase designation

^aFor red phase designation

^bFor yellow phase designation

^cFor green phase designation

Use the neutral conductor only with the phases associated with that cable. Do not intermix neutral conductors from different cables except at the signal controller.

87-1.03F(2)(c)(iv) Signal Interconnect Cable

For a signal interconnect cable, provide a minimum of 6 feet of slack inside each controller cabinet.

Do not splice the cable unless authorized.

If splices are authorized, insulate the conductor splices with heat-shrink tubing and overlap the insulation at least 0.6 inch. Cover the splice area of the cable with heat-shrink tubing and overlap the cable jacket at least 1-1/2 inches. Provide a minimum of 3 feet of slack at each splice.

87-1.03F(3) Conductors

87-1.03F(3)(a) General

Do not run conductors to a terminal block on a standard unless they are to be connected to a signal head mounted on that standard.

Provide 3 spare conductors in all conduits containing ramp metering and traffic signal conductors.

Install a separate conductor for each terminal of a push button assembly and accessible pedestrian signal.

Provide conductor slack to comply with the requirements shown in the following table:

| Conductor Slack Requirements | |
|-------------------------------------|--------------|
| Location | Slack (feet) |
| Signal standard | 1 |
| Lighting standard | 1 |
| Signal and lighting standard | 1 |
| Pull box | 3 |
| Splice | 3 |
| Standards with slip base | 0 |

87-1.03F(3)(b) Reserved

87-1.03F(3)(c) Copper Conductors

87-1.03F(3)(c)(i) General

Install a minimum no. 8, insulated, grounding copper conductor in conduit and connect it to all-metal components.

Where conductors from different service points occupy the same conduit or standard, enclose the conductors from one of the services in flexible or rigid metal conduit.

87-1.03F(3)(c)(ii) Inductive Loop Conductors

Install a Type 1 or 2 inductive loop conductor except use Type 2 for Type E loop detectors.

Install the conductor without splices except at the pull box.

87-1.03F(4) Manual Installation Method

Use an inert lubricant for placing conductors and cables in conduit.

Pull the conductors and cables into the conduit by hand using pull tape.

87-1.03G Equipment Identification Characters

The Engineer provides you with a list of the equipment identification characters.

Stencil the characters or apply the reflective self-adhesive labels to a clean surface.

Treat the edges of self-adhesive characters with an edge sealant.

Place the characters on the side facing traffic on:

1. Front doors of cabinets and service equipment enclosures.
2. Wood poles, fastened with 1-1/4-inch aluminum nails, for pole mounted enclosures
3. Adjacent bent or abutment at approximately the same station as an illuminated sign or soffit luminaire
4. Underside of the structure adjacent to the illuminated sign or soffit luminaire if no bent or abutment exists nearby
5. Posts of overhead signs
6. Standards

Before placing new characters on existing or relocated equipment, remove the existing characters.

87-1.03H Conductor and Cables Splices

87-1.03H(1) General

You may splice:

1. Grounded conductors in a pull box
2. Accessible pedestrian signal and push bottom conductors in a pull box
3. Ungrounded signal conductors in a pull box if signals are modified
4. Ungrounded signal conductors to a terminal compartment or a signal head on a standard with conductors of the same phase in the pull box adjacent to the standard
5. Ungrounded lighting circuit conductors in a pull box if lighting circuits are modified

Solder all splices using the hot iron, pouring, or dipping method. Do not perform open-flame soldering.

87-1.03H(2) Splice Insulation Methods

Insulate splices in a multiconductor cable to form a watertight joint and to prevent moisture absorption by the cable.

Use heat-shrink tubing or Method B to insulate a splice.

Use heat-shrink tubing as follows:

1. Cover the splice area completely with an electrical insulating coating and allow it to dry.
2. Place mastic around each conductor before placing them inside the tubing. Use the type of mastic specified in the tubing manufacturer's instructions.
3. Heat the area under the manufacturer's instructions. Do not perform open-flame heating. After contraction, each end of the heat-shrink tubing or the open end of the tubing's end cap must overlap the conductor insulation at least 1-1/2 inches.
4. Cover the entire splice with an electrical insulating coating and allow it to dry.

Use Method B as follows:

1. Cover the splice area completely with an electrical insulating coating and allow it to dry.
2. Apply 3 layers of half-lapped, 80-mils, PVC tape.
3. Apply 2 layers of 120-mils, butyl-rubber, stretchable tape with liner.
4. Apply 3 layers of half-lapped, 6-mils, PVC, pressure-sensitive, adhesive tape.
5. Cover the entire splice with an electrical insulating coating and allow it to dry.

87-1.03I Connectors and Terminals

Apply connectors and terminals to cables and conductors using a crimping compression tool under the manufacturer's instructions. The tool must prevent opening of the handles until the crimp is completed.

Install crimp-style terminal lugs on stranded conductors smaller than no. 14.

Solder no. 8 and smaller conductors to connectors and terminal lugs.

87-1.03J Standards, Poles, Pedestals, and Posts

Install standards, poles, pedestals, and posts under section 56-3.

Ground standards with a handhole by attaching a bonding jumper from the bolt or lug inside the standard to a metal conduit or to the grounding wire in the adjacent pull box. The bonding jumper must be visible when the handhole cover is removed.

Ground standards without a handhole or standards with a slip base by attaching a bonding jumper to all anchor bolts using ground clamps and connecting it to a metal conduit or to the grounding wire in the adjacent pull box. The bonding jumper must be visible after mortar has been placed on the foundation.

87-1.03K Reserved

87-1.03L Utility Service

87-1.03L(1) General

Install the service equipment early enough to allow the utility to complete its work before completion of the electrical work.

At least 15 days before permanent electrical and telecommunication service is required, request the service connections for permanent installations. The Department arranges with the utilities for completion of the connections and pays all costs and fees required by the utilities.

87-1.03L(2) Electric Service

87-1.03L(2)(a) General

If service equipment is to be installed on a utility-owned pole, furnish and install the conduit, conductors, pull boxes, and other necessary material to complete the service installation. The service utility decides the position of the riser and equipment on the pole.

87-1.03L(2)(b) Electric Service for Irrigation

Establishing electric service for irrigation includes installing conduit, conductors, and pull boxes and making connections from the service point to the irrigation controllers.

87-1.03L(2)(c) Electric Service for Booster Pumps

Establishing electric service for a booster pump includes installing conduit, conductors, and pull boxes and making connections from the service point to the booster pump enclosure.

87-1.03L(3) Telecommunications Service

Establishing telecommunication service includes installing conduit, conductors, and pull boxes and making connections from the service point to the telephone demarcation cabinet.

87-1.03M Photoelectric Controls

Mount the photoelectric unit on the top of the pole for Type I, II, and III photoelectric controls. Use mounting brackets where pole-top mounting is not possible. Orient the photoelectric unit to face north.

Mount the enclosure at a height of 6 feet above finished grade on the same standard as the photoelectric unit.

Install a minimum 100 VA, 480/120 V(ac) transformer in the contactor enclosure to provide 120 V(ac) for the photoelectric control unit when switching 480 V(ac), 60 Hz circuits.

87-1.03N Fused Splice Connectors

Install a fuse splice connector in each ungrounded conductor for luminaires mounted on standards. The connector must be located in the pull box adjacent to the standard.

Crimp the connector terminals onto the ungrounded conductors using a tool under the manufacturer's instructions. Insulate the terminals and make them watertight.

87-1.03O Grounding Electrodes

Install a grounding electrode for each cabinet, service equipment enclosure, and transformer.

Attach a grounding conductor from the electrode using either a ground clamp or exothermic weld. Connect the other end of the conductor to the cabinet, service equipment enclosure, and transformer.

87-1.03P Service Equipment Enclosures

Installing a service equipment enclosure includes constructing the foundation and pad and installing conduit, adjacent pull boxes, and grounding electrode.

Locate the foundation such that the minimum clearance around the front and back of the enclosure complies with NEC, article 110.26, "Spaces About Electrical Equipment, (600 V, nominal or less)."

Bond and ground metal conduit as specified in NEC and by the service utility except the grounding electrode conductor must be no. 6 or larger.

If circuit breakers and components do not have a description on engraved phenolic nameplates, install them using stainless steel rivets or screws under section 86-1.02P(2).

87-1.03Q Cabinets

87-1.03Q(1) General

Installing a cabinet includes constructing the foundation and pad and installing conduit, adjacent pull boxes, and grounding electrode.

Apply a mastic or caulking compound before installing the cabinet on the foundation to seal the openings.

Connect the field wiring to the terminal blocks in the cabinet. Neatly arrange and lace or enclose the conductors in plastic tubing or raceway. Terminate the conductors with properly sized captive or spring spade terminals. Apply a crimp-style connector and solder them.

Install and solder a spade-type terminal on no. 12 and smaller field conductors and a spade-type or ring-type terminal on conductors larger than no. 12.

87-1.03Q(2) Department-Furnished Controller Cabinets

Arrange for the delivery of Department-furnished controller cabinets.

87-1.03Q(3) Reserved

87-1.03Q(4) Telephone Demarcation Cabinets

Installing a telephone demarcation cabinet includes installing conduit, cable, and pull boxes to the controller cabinet.

Install the cabinet with the back toward the nearest lane of traffic.

87-1.03R Signal Heads

87-1.03R(1) General

Installing a signal head includes mounting the heads on standards and mast arms, installing backplates and visors, and wiring conductors to the terminal blocks.

Keep the heads covered or direct them away from traffic until the system is ready for operation.

87-1.03R(2) Signal Faces

Use the same brand and material for the signal faces at each location.

Program the programmable visibility signal faces under the manufacturer's instructions. The indication must be visible only in those areas or lanes to be controlled.

87-1.03R(3) Backplates

Install backplates using at least six 10-24 or 10-32 self-tapping and locking stainless steel machine screws and flat washers.

If a plastic backplate requires field assembly, attach each joint using at least four no.10 machine screws. Each machine screw must have an integral or captive flat washer, a hexagonal head slotted for a standard screwdriver, and either a locking nut with an integral or captive flat washer or a nut, flat washer,

and lock washer. Machine screws, nuts, and washers must be stainless steel or steel with a zinc or black oxide finish.

If a metal backplate has 2 or more sections, fasten the sections with rivets or aluminum bolts peened after assembly to avoid loosening.

Install the backplate such that the background light is not visible between the backplate and the signal face or between sections.

87-1.03R(4) Signal Mounting Assemblies

Install a signal mounting assembly such that its members are arranged symmetrically and plumb or level. Orient each mounting assembly to allow maximum horizontal clearance to the adjacent roadway.

For a bracket-mounted assembly, bolt the terminal compartment or pole plate to the pole or standard.

In addition to the terminal compartment mounting, attach the upper pipe fitting of Type SV-1-T with 5 sections or a SV-2-TD to the standard or pole using the mounting detail for signal heads without a terminal compartment.

Use a 4-1/2-inch slip fitter and set screws to mount an assembly on a post top.

After installing the assembly, clean and paint the exposed threads of the galvanized conduit brackets and bracket areas damaged by the wrench or vise jaws. Use a wire brush to clean and apply 2 coats of unthinned, organic zinc-rich primer. Do not use an aerosol can to apply the primer.

Install the conductors in the terminal compartment and secure the cover.

87-1.03S Pedestrian Signal Heads

Installing a pedestrian signal head includes mounting the heads on standards and wiring conductors to the terminal blocks.

Install the pedestrian signal mounting assembly under section 87-1.03R(4).

Use the same brand and material for the pedestrian signal faces at each location.

Install a pedestrian signal face such that its members are arranged symmetrically and plumb or level.

87-1.03T Accessible Pedestrian Signals

Use the same brand for the accessible pedestrian signals at each location.

Install an accessible pedestrian signal and the R10 series sign on the crosswalk side of the standard.

Attach the accessible pedestrian signal to the standard with self-tapping screws.

Attach the sign to the standard using 2 straps and saddle brackets.

Point the arrow on the accessible pedestrian signal in the same direction as the corresponding crosswalk.

Furnish the equipment and hardware to set up and calibrate the accessible pedestrian signal.

Arrange to have a manufacturer's representative at the job site to program the accessible pedestrian signal with an audible message or tone.

87-1.03U Push Button Assemblies

Install the push button assembly and the R10 series sign on the crosswalk side of the standard.

Attach the sign to the assembly for Type B assemblies.

Attach the sign to the standard using 2 straps and saddle brackets for Type C assemblies.

You may use straps and saddle brackets to secure the push button to the standard.

Use a slip fitter to secure the assembly on top of a 2-1/2-inch-diameter post.

87-1.03V Detectors

87-1.03V(1) General

Installing a detector includes installing inductive loop conductors, sealant, conduit, and pull boxes.

Center the detectors in the traffic lanes.

Do not splice the detector conductor.

87-1.03V(2) Inductive Loop Detectors

Mark the location of the inductive loop detectors such that the distance between the side of the loop and a lead-in saw cut from an adjacent detector is at least 2 feet. The distance between lead-in saw cuts must be at least 6 inches.

Saw cut the slots under section 13-4.03E(7). The bottoms of the slots must be smooth with no sharp edges. For Type E detector loops, saw the slots such that the sides are vertical.

Wash the slots clean using water and blow dry them with compressed air to remove all moisture and debris.

Identify the start of the conductor.

Waterproof the ends of a Type 2 loop conductor before installing it in the conduit to prevent moisture from entering the cable.

Install the loop conductor in the slots and lead-in saw cuts using a 3/16- to 1/4-inch-thick wood paddle. Hold the conductors in place at the bottom of the slot with wood paddles during placement of the sealant.

Wind adjacent loops on the same sensor unit channel in opposite directions.

Twist the conductors for each loop into a pair consisting of a minimum of 2 turns per foot before placing them in the lead-in saw cut and the conduit leading to the pull box. Do not install more than 2 twisted pairs of conductors per lead-in saw cut.

Provide 5 feet of slack in the pull box.

Test each loop for continuity, circuit resistance, and insulation resistance before filling the slots with sealant.

Remove excess sealant from the adjacent road surface before it sets. Do not use solvents to remove the excess.

Identify the loop conductor pair in the pull box, marking the start with the letter *S* and the end with the letter *F*. Band conductors in pairs by lane in the pull box adjacent to the loops and in the cabinet. Identify each pair with the detector designation and loop number.

Install the conductors in a compacted layer of HMA immediately below the uppermost layer if more than one layer will be placed. Install the loop conductors before placing the uppermost layer of HMA. Fill the slot with a sealant flush to the surface.

Install the conductors in the existing pavement if one layer of HMA is to be placed. Install the loop conductors before placing the layer of HMA. Fill the slot with a sealant flush to the surface.

87-1.03V(3) Preformed Inductive Loop Detectors

Construct a preformed inductive loop detector consisting of 4 turns in the loop and a lead-in conductor pair twisted at least 2 turns per foot all encased in conduit and sealed to prevent water penetration. The detector must be 6-foot square unless shown otherwise.

Construct the loop detector using a minimum 3/8-inch Schedule 40 or Schedule 80 PVC or polypropylene conduit and no. 16 or larger conductor with Type THWN or TFFN insulation.

In new roadways, place the detector in the base course with the top of the conduit flush with the top of the base. Cover with HMA or concrete pavement. Protect the detector from damage before and during pavement placement.

In new reinforced concrete bridge decks, secure the detector to the top of the uppermost layer of reinforcing steel using nylon wire ties. Hold the detector parallel to the bridge deck using PVC or polypropylene spacers where necessary. Place conduit for lead-in conductors between the uppermost 2 layers of reinforcing steel.

Do not install detectors in existing bridge decks unless authorized.

Install a detector in existing pavement before placement of concrete or HMA as follows:

1. Saw cut slots at least 1-1/4 inches wide into the existing pavement.
2. Place the detector in the slots. The top of the conduit must be at least 2 inches below the top of the pavement.
3. Test each loop circuit for continuity, circuit resistance, and insulation resistance.
4. Fill saw cuts with elastomeric or hot melt rubberized asphalt sealant for asphalt concrete pavement and with epoxy sealant or hot melt rubberized asphalt sealant for concrete pavement.

87-1.03W Sealants

87-1.03W(1) General

Reserved

87-1.03W(2) Elastomeric Sealant

Apply an elastomeric sealant with a pressure feed applicator.

87-1.03W(3) Asphaltic Emulsion Sealant

Asphaltic emulsion sealant must:

1. Be used for filling slots in asphalt concrete pavement of a maximum width of 5/8 inch
2. Not be used on concrete pavement or where the slope causes the material to run from the slot
3. Be thinned under the manufacturer's instructions
4. Be placed when the air temperature is at least 45 degrees F

87-1.03W(4) Hot-Melt Rubberized Asphalt Sealant

Melt the sealant in a jacketed, double-boiler-type, melting unit. The temperature of the heat transfer medium must not exceed 475 degrees F.

Apply the sealant with a pressure feed applicator or a pour pot when the surface temperature of the pavement is greater than 40 degrees F.

87-1.03X Reserved

87-1.03Y Transformers

Installing a transformer includes placing the transformer inside a pull box, a cabinet, or an enclosure.

Wire the transformer for the appropriate voltage.

Ground the secondary circuit of the transformer as specified in the NEC.

87-1.03Z Reserved

87-1.04 PAYMENT

Not Used

87-2 LIGHTING SYSTEMS

87-2.01 GENERAL

87-2.01A Summary

Section 87-2 includes specifications for constructing lighting systems.

Lighting system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Standards
6. Luminaires
7. Service equipment enclosure
8. Photoelectric control
9. Fuse splice connectors
10. High mast lighting assemblies

The components of a lighting system are shown on the project plans.

87-2.01B Definitions

Reserved

87-2.01C Submittals

Submit a certificate of compliance and test data for the high mast lighting luminaires.

87-2.01D Quality Assurance

Reserved

87-2.02 MATERIALS

87-2.02A General

Reserved

87-2.02B High Mast Lighting Assemblies

A high mast lighting assembly includes the foundation, pole, lowering device system, luminaires, and control pedestal.

Each luminaire in a high mast lighting assembly must include a housing, an optical system, and a ballast.

The housing must be made of aluminum.

A painted or powder-coated housing for a high mast lighting luminaire must be able to withstand a 1,000-hour salt spray test as specified in ASTM B117.

The optical system, consisting of the reflector, refractor or lens, lamp socket, and lamp, must be in a sealed chamber. The chamber must be sealed by a gasket between the reflector and refractor or lens and a gasket between the reflector and lamp socket. The chamber must have a separate filter or filtering gasket for flow of air.

An asymmetrical luminaire must have a refractor or reflector that is rotatable 360 degrees around a vertical axis to orient the distribution of light.

The luminaire must have a slip fitter for mounting on a 2-inch horizontal pipe tenon and must be adjustable ± 3 degrees from the axis of the tenon.

The reflector must have a specular surface made of silvered glass or aluminum protected by either an anodized finish or a silicate film. The reflector must be shaped such that a minimum of light is reflected through the arc tube of the lamp.

The refractor and lens must be made of heat-resistant glass.

The lamp socket must be a porcelain-enclosed, mogul-multiple type. The shell must contain integral lamp grips to ensure electrical contact under conditions of normal vibrations. The socket must be rated for 1,500 W, 600 V(ac) and 4,000 V(ac) pulse for a 400 W lamp and 5,000 V(ac) pulse for a 1,000 W lamp.

The luminaire must have a dual fuse holder for 2 fuses rated at 5 A, 480 V(ac). The fuses must be 13/32 inch by 1-1/2 inches, standard midget ferrule type with a nontime-delay feature.

The lamps must be vertical burning, protected from undue vibration, and prevented from backing out of the socket by a stainless steel clamp attached to the luminaire.

A 1,000 W metal halide lamp must have an initial output of 100,000 lumens and an average rated life of 12,000 hours based on 10 hours per start.

A 400 W high-pressure sodium lamp must have an initial output of 50,000 lumens. A 1,000 W high-pressure sodium lamp must have an initial output of 140,000 lumens.

The ballast for the luminaire must be a regulator type and have a core and coils, capacitors, and starting aid.

Ballast must be:

1. Mounted within a weatherproof housing that integrally attaches to the top of a luminaire support bracket and lamp support assembly
2. Readily removable without removing the luminaire from the bracket arm
3. Electrically connected to the optical assembly by a prewired quick disconnect

The ballast for a metal halide luminaire must comply with luminaire manufacturer's specifications.

The wattage regulation spread at any lamp voltage, from nominal through the life of the lamp, must vary no more than 22 percent for a 1,000 W lamp and a ± 10 percent input voltage variation. The ballast's starting line current must be less than its operating current.

87-2.02C Soffit and Wall-Mounted Luminaires

87-2.02C(1) General

Soffit and wall-mounted luminaires must be weatherproof and corrosion resistant.

Each luminaire must include a 70 W high-pressure sodium lamp with a minimum average rated life of 24,000 hours. The lamp socket must be positioned such that the light center of the lamp is located within 1/2 inch of the designed light center of the luminaire.

Luminaire wiring must be SFF-2.

Flush-mounted soffit luminaire must have:

1. Metal body with two 1-inch-minimum conduit hubs and a means of anchoring the body into the concrete
2. Prismatic refractor made of heat-resistant polycarbonate:
 - 2.1. Mounted in a door frame
 - 2.2. With the street side identified
3. Aluminum reflector with a specular anodized finish
4. Ballast located either within the housing or in a ceiling pull box if shown
5. Lamp socket

The door frame assembly must be hinged, gasketed, and secured to the luminaire body with at least 3 machine screws.

A pendant soffit luminaire must be enclosed and gasketed and have an aluminum finish. Luminaire must have:

1. Aluminum reflector with a specular anodized finish
2. Refractor made of heat-resistant polycarbonate
3. Optical assembly that is hinged and latched for lamp access and a device to prevent dropping
4. Ballast designed for operation in a raintight enclosure
5. Galvanized metal box with a gasketed cover, 2 captive screws, and 2 chains to prevent dropping and for luminaire mounting

Wall-mounted luminaire must have:

1. Cast metal body
2. Prismatic refractor:
 - 2.1. Made of glass
 - 2.2. Mounted in a door frame
3. Aluminum reflector with a specular anodized finish
4. Integral ballast
5. Lamp socket
6. Gasket between the refractor and the body
7. At least 2 mounting bolts of minimum 5/16-inch diameter

A cast aluminum body of a luminaire to be cast into or mounted against concrete must have a thick coat of alkali-resistant bituminous paint on all surfaces to be in contact with the concrete.

87-2.02C(2) High-Pressure Sodium Lamp Ballasts

87-2.02C(2)(a) General

A high-pressure sodium lamp ballast must operate the lamp for its rated wattage.

Starting aids for a ballast must be interchangeable between ballasts of the same wattage and manufacturer without adjustment.

The ballast must be provided with a heat-generating component to serve as a heat sink. The capacitor must be placed at the maximum practicable distance from the heat-generating components or thermally shielded to limit the case temperature to 75 degrees C.

The transformer and inductor must be resin impregnated for protection against moisture. Capacitors, except for those in starting aids, must be metal cased and hermetically sealed.

The ballast must have a power factor of 90 percent or greater.

For the nominal input voltage and lamp voltage, the ballast design center must not vary more than 7.5 percent from the rated lamp wattage.

87-2.02C(2)(b) Regulator-Type Ballasts

A regulator-type ballast must be designed such that a capacitance variance of ± 6 percent does not cause more than ± 8 percent variation in the lamp wattage regulation.

The ballast must have a current crest factor not exceeding 1.8 for an input voltage variation of ± 10 percent.

The lamp wattage regulation spread for a lag-type ballast must not vary by more than 18 percent for ± 10 percent input voltage variations. The primary and secondary windings must be electrically isolated.

The lamp wattage regulation spread for a constant-wattage, autoregulator, lead-type ballast must not vary by more than 30 percent for ± 10 percent input voltage variations.

87-2.02C(2)(c) Nonregulator-Type Ballasts

A nonregulator-type ballast must have a current crest factor not exceeding 1.8 for an input voltage variation of ± 5 percent.

The lamp wattage regulation spread for an autotransformer or high reactance type ballast must not vary by more than 25 percent for ± 5 percent input voltage variations.

87-2.03 CONSTRUCTION

87-2.03A General

Set the foundations for standards such that the mast arm is perpendicular to the centerline of the roadway.

Tighten the cap screws of the luminaire's clamping bracket to 10 ft-lb for LED and low-pressure luminaires.

Label the month and year of the installation inside the luminaire housing's door.

Perform the conductor and operational tests for the system.

87-2.03B High Mast Lighting Assemblies

Mount and connect the luminaires to the accessory support ring. Aim the asymmetrical luminaire to orient the distribution of light.

87-2.03C Soffit and Wall-Mounted Luminaires

For a flush-mounted soffit luminaire:

1. Prevent concrete from getting into the housing during pouring of the concrete for the structure
2. Install the luminaire with the axis vertical and the street side of the refractor oriented as indicated
3. Locate the luminaire to provide a minimum 2-foot clearance from the inside surface of the girders and 1-foot clearance from the near face of the diaphragm
4. Install the bridge soffit and ceiling pull box over the same lane

For a pendant soffit luminaire:

1. Cast in place the inserts for the no. 8 pull box during concrete placement for a new structure
2. Drill holes for expansion anchors to support the no. 8 pull box on existing structures
3. Bond the suspension conduit and luminaire to the pull box

For a wall-mounted luminaire, provide:

1. Extension junction box or ring on a new structure
2. 4 external mounting taps on an existing structure

Place the soffits or wall-mounted luminaires in operation as soon as practicable after the falsework has been removed from the structure.

If the Engineer orders soffit or wall-mounted luminaires to be activated before permanent power service is available, installing and removing the temporary power service is change order work.

87-2.04 PAYMENT

Not Used

87-3 SIGN ILLUMINATION SYSTEMS

87-3.01 GENERAL

87-3.01A Summary

Section 87-3 includes specifications for constructing sign illumination systems.

Sign illumination system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Sign lighting fixtures
6. Enclosure for the disconnect circuit breaker
7. Service equipment enclosure
8. Photoelectric control

The components of a sign illumination system are shown on the project plans.

87-3.01B Definitions

Reserved

87-3.01C Submittals

Submit the manufacturer's test data for the induction sign-lighting fixtures.

87-3.01D Quality Assurance

Reserved

87-3.02 MATERIALS

An induction sign-lighting fixture must include a housing with a door, reflector, refractor or lens, lamp, socket assembly, power coupler, high-frequency generator, fuse block, and fuses.

The fixture must comply with the isofootcandle curves as shown.

Fixture must weigh no more than 44 lb, be rated for 87 W at 120/240 V(ac), and have a mounting assembly made of one of the following materials:

1. Cast aluminum
2. Hot-dip galvanized steel plate
3. Galvanized steel plate finished with one of the following:
 - 3.1. Polymeric coating
 - 3.2. Same finish used for the housing

Housing must:

1. Be corrosion resistant and suitable for wet locations
2. Be above the top of the mounting rails at a maximum height of 12 inches
3. Have weep holes

Door must:

1. Hold a refractor or lens
2. Open without the use of special tools
3. Have a locking position at 50 degrees minimum from the plane of the door opening
4. Be hinged to the housing on the side of the fixture away from the sign panel
5. Have 2 captive latch bolts or other latching device

When the door is opened, it must lock in the 50 degrees position when an 85 mph, 3-second wind-gust load strikes the door from either side.

The housing and door must be manufactured of sheet or cast aluminum and have a gray powder coat or polyester paint finish. The sheet aluminum must comply with ASTM B209 or B209M for 5052-H32 aluminum sheet. External bolts, screws, hinges, hinge pins, and door closure devices must be corrosion resistant.

The housing and door must be gasketed. The thickness of the gasket must be a minimum of 1/4 inch.

Reflector must not be attached to the outside of the housing and must be:

1. Made of a single piece of aluminum with a specular finish
2. Protected with an electrochemically applied anodized finish or a chemically applied silicate film
3. Designed to drain condensation away from it
4. Secured to the housing with a minimum of 2 screws
5. Removable without removing any fixture parts

Refractor or lens must have a smooth exterior and must be manufactured from the materials shown in the following table:

| Component | Material |
|-------------|------------------------------------------------------|
| Flat lens | Heat-resistant glass |
| Convex lens | Heat-resistant, high-impact-resistant tempered glass |
| Refractor | Borosilicate heat-resistant glass |

The refractor and convex lens must be designed or shielded such that no luminance is visible if the fixture is approached directly from the rear and viewed from below. If a shield is used, it must be an integral part of the door casting.

Lamp must:

1. Be an 85 W induction type with a fluorescent, phosphor-coated, interior wall
2. Have a minimum 70 percent light output of its original lumen output after 60,000 hours of operation
3. Have a minimum color-rendering index of 80
4. Be rated at a color temperature of 4,000K
5. Be removable with common hand tools

The lamp socket must be rated for 1,500 W and 600 V(ac) and be a porcelain-enclosed mogul type with a shell that contains integral lamp grips to ensure electrical contact under normal vibration conditions. The shell and center contact must be made of nickel-plated brass. The center contact must be spring loaded.

The power coupler must be removable with common hand tools.

High-frequency generator must:

1. Start and operate lamps at an ambient temperature of -25 degrees C or greater for the rated life of the lamp
2. Operate continuously at ambient air temperatures from -25 to 55 degrees C without a reduction in the generator life
3. Have a design life of at least 100,000 hours at 55 degrees C
4. Have an output frequency of 2.65 MHz \pm 10 percent
5. Have radio frequency interference that complies with 47 CFR 18 regulations regarding harmful interference
6. Have a power factor greater than 90 percent and total harmonic distortion less than 10 percent

The high frequency generator must be mounted such that the fixture can be used as a heat sink and be replaceable with common hand tools.

Each fixture must include a barrier-type fuse block for terminating field connections. Fuse block must:

1. Be rated 600 V(ac)
2. Have box terminals
3. Be secured to the housing and accessible without removal of any fixture parts
4. Be mounted to leave a minimum of 1/2 inch of air space from the sidewalls of the housing
5. Be designed for easy removal of fuses with a fuse puller

The fixture's fuses must be 13/32-inch-diameter, 1-1/2-inch-long ferrule type and UL listed or NRTL certified. For a 120 V(ac) fixture, only the ungrounded conductor must be fused and a solid connection must be provided between the grounded conductor and the high frequency generator.

The fixture must be permanently marked with the manufacturer's brand name, trademark, model number, serial number, and date of manufacture on the inside and outside on the housing. The same information must be marked on the package.

If a wire guard is used, it must be made of a minimum 1/4-inch-diameter galvanized steel wire. The wires must be spaced to prevent rocks larger than 1-1/2-inch diameter from passing through the guard. The guard must be either hot-dip galvanized or electroplated zinc-coated as specified in ASTM B633, service condition SC4, with a clear chromate dip treatment.

87-3.03 CONSTRUCTION

Perform the conductor and operational tests for the system.

87-3.04 PAYMENT

Not Used

87-4 SIGNAL AND LIGHTING SYSTEMS

87-4.01 GENERAL

87-4.01A Summary

Section 87-4 includes specifications for constructing signal and lighting systems.

Signal and lighting system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Cables
6. Standards
7. Signal heads
8. Internally illuminated street name signs
9. Service equipment enclosure
10. Department-furnished controller assembly
11. Detectors
12. Telephone demarcation cabinet
13. Accessible pedestrian signals
14. Push button assemblies
15. Pedestrian signal heads
16. Luminaires
17. Photoelectric control
18. Fuse splice connectors
19. Battery backup system

- 20. Flashing beacons
- 21. Flashing beacon control assembly

The components of a signal and lighting system are shown on the project plans.

87-4.01B Definitions

Reserved

87-4.01C Submittals

Submit shop drawings showing the message for each internally illuminated street sign, including the size of letters, symbols, and arrows.

87-4.01D Quality Assurance

87-4.01D(1) General

Reserved

87-4.01D(2) Quality Control

87-4.01D(2)(a) General

Reserved

87-4.01D(2)(b) Battery Backup System

Notify the Engineer 48 hours before testing the battery backup system.

Test the system in the presence of the Engineer by turning off the power to the signal system at the service equipment enclosure. The signal system must run continuously for 30 minutes. If the battery backup system fails, correct the problem and retest the system for another 30 minutes. After successful completion of the test, turn the power on for the signal system.

87-4.02 MATERIALS

87-4.02A General

Reserved

87-4.02B Battery Backup System

A battery backup system includes the cabinet, batteries, and the Department-furnished electronics assembly.

The electronics assembly includes the inverter/charger unit, power transfer relay, and the battery harness.

87-4.02C Internally Illuminated Street Name Signs

An internally illuminated street name sign includes housing, brackets, sign panels, gaskets, ballast, lampholder, terminal blocks, conductors, and fuses.

An internally illuminated street sign must be designed and constructed to prevent deformation or failure when subjected to an 85 mph, 3-second wind-gust load as specified in the AASHTO publication, "Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals."

Sign must:

- 1. Be Types A or B
- 2. Have galvanized or cadmium-plated ferrous parts
- 3. Have screened weep holes
- 4. Have fasteners, screws, and hardware made of passive stainless steel, Type 302 or 304, or aluminum Type 6060-T6
- 5. Operate at a temperature from -20 to 74 degrees C

Photoelectric unit sockets are not allowed.

The housing must be constructed to resist torsional twist and warp. The housing must be designed such that opening or removing the panels provides access to the interior of the sign for lamp, ballast, and fuse replacement.

The top and bottom of the sign must be manufactured from formed or extruded aluminum and attached to formed or cast aluminum end fittings. The top, bottom, and end fittings must form a sealed housing.

For a Type A sign, both sides of the sign must be hinged at the top to allow installation or removal of the sign panel.

For a Type B sign, the sign panel must be slide mounted into the housing.

The top of the housing must have 2 free-swinging mounting brackets. Each bracket must be vertically adjustable for leveling the sign to either a straight or curved mast arm. The bracket assembly must allow the lighting fixture to swing perpendicular to the sign panel.

The reflectors must be formed aluminum and have an acrylic, baked-white-enamel surface with a minimum reflectance of 0.85.

Sign panel must be translucent, high-impact-resistant, and made of one of the following plastic materials:

1. Glass-fiber-reinforced, acrylated resin
2. Polycarbonate resin
3. Cellulose acetate butyrate

The sign panel must be designed not to crack or shatter if a 1-inch-diameter steel ball weighing 2.4 ounces is dropped from a height of 8.5 feet above the sign panel to any point on the panel. For this test, the sign panel must be lying in a horizontal position and supported within its frame.

The sign panel's surface must be evenly illuminated. The brightness measurements for the letters must be a minimum of 150 foot-lamberts, average. The letter-to-background brightness ratio must be from 10:1 to 20:1. The background luminance must not vary by more than 40 percent from the average background brightness measurement. The luminance of letters, symbols, and arrows must not vary by more than 20 percent from their average brightness measurement.

The sign panel's white or green color must not fade or darken if exposed to an accelerated test of UV light equivalent to 2 years of outdoor exposure.

The sign panel's legend, symbols, arrows, and border on each face must be white on a green background. The background must comply with color no. 14109 of FED-STD-595.

The message must appear on both sides of the sign and be protected from UV radiation. The letters must be 8-inch upper case and 6-inch lower case, series E.

A Type A sign must have a closed-cell, sponge-neoprene gasket installed between the sign panel frame to prevent the entry of water. The gasket must be uniform and even textured.

The sign ballast must be a high-power-factor type for outdoor operation from 110 to 125 V(ac) and 60 Hz and must comply with ANSI C82.1 and C82.2.

The ballast for a Type A sign must be rated at 200 mA. The ballast for a Type B sign must be rated at 430 mA.

Sign lampholder must:

1. Be the spring-loaded type
2. Have silver-coated contacts and waterproofed entrance leads
3. Have a heat-resistant, circular cross section with a partially recessed neoprene ring

Removal of the lamp from the socket must de-energize the primary of the ballast.

The springs for the lampholders must not be a part of the current-carrying circuit.

The sign's wiring connections must terminate on a molded, phenolic, barrier-type, terminal block rated at 15 A, 1,000 V(ac). The connections must have a white, integral, waterproof marking strip. The terminal screws must not be smaller than a no. 10.

The terminal block must be insulated from the fixture to provide protection from the line-to-ground flashover voltage.

A sectionalized terminal block must have an integral barrier on each side and must allow rigid mounting and alignment.

Fixture's conductors must:

1. Be stranded copper wire with a minimum thermoplastic insulation of 28 mils
2. Be rated at 1,000 V(ac) and for use up to 90 degrees C
3. Be a minimum of no. 16
4. Match the color coding of the ballast leads
5. Be secured with spring cross straps, installed 12 inches apart or less in the chassis or fixture

Stranded copper conductors connected to screw-type terminals must terminate in crimp-type ring connectors.

No splicing is allowed within the fixture.

The sign's fuse must be the Type 3AG, miniature, slow-blow type.

The fuse holder must be a panel-mounting type with a threaded or bayonet knob that grips the fuse tightly for extraction. Each ballast must have a separate fuse.

87-4.03 CONSTRUCTION

87-4.03A General

Set the foundations for standards such that the mast arm is perpendicular to the centerline of the roadway.

Tighten the cap screws of the luminaire's clamping bracket to 10 ft-lb for LED and low-pressure luminaires.

Label the month and year of the installation inside the luminaire housing's door.

Perform the conductor and operational tests for the system.

87-4.03B Battery Backup System Cabinets

Install the battery backup system cabinet to the right of the Model 332L cabinet.

If installation on the right side is not feasible, obtain authorization for installation on the left side.

Provide access for power conductors between the cabinets using:

1. 2" nylon-insulated, steel chase nipple
2. 2" steel sealing locknut
3. 2" nylon-insulated, steel bushing

Remove the jumper between the terminals labeled *BBS-1* and *BBS-2* in the 5 position terminal block in the controller cabinet before connecting the Department-furnished electronics assembly.

87-4.03C Internally Illuminated Street Name Signs

Mount the internally illuminated street name sign to the signal mast arm using the adjustable brackets. Connect the conductors to the terminal blocks in the signal head mounting terminal block.

87-4.04 PAYMENT

Not Used

87-5 RAMP METERING SYSTEMS

87-5.01 GENERAL

Section 87-5 includes specifications for constructing ramp metering systems.

Ramp metering system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Standards
6. Signal heads
7. Service equipment enclosure
8. Department-furnished controller assembly
9. Detectors
10. Telephone demarcation cabinet

The components of a ramp metering system are shown on the project plans.

87-5.02 MATERIALS

Not Used

87-5.03 CONSTRUCTION

Connect the field wiring to the terminal blocks in the controller cabinet. The Engineer provides you a list of field conductor terminations for each controller cabinet.

Perform the conductor and operational tests for the system.

87-5.04 PAYMENT

Not Used

87-6 TRAFFIC MONITORING STATION SYSTEMS

87-6.01 GENERAL

Section 87-6 includes specifications for constructing traffic monitoring station systems.

Traffic monitoring station system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Cables
5. Conductors
6. Service equipment enclosure
7. Controller cabinet
8. Detectors
9. Telephone demarcation cabinet

The components of a traffic monitoring station system are shown on the project plans.

87-6.02 MATERIALS

Not Used

87-6.03 CONSTRUCTION

Connect the field wiring to the terminal blocks in the controller cabinet. The Engineer provides you a list of field conductor terminations for the controller cabinet.

Perform the conductor and operational tests for the system.

87-6.04 PAYMENT

Not Used

87-7 FLASHING BEACON SYSTEMS

87-7.01 GENERAL

Section 87-7 includes specifications for constructing flashing beacon systems.

Flashing beacon system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Standards
6. Service equipment enclosure
7. Signal heads
8. Flashing beacon control assembly

The components of a flashing beacon system are shown on the project plans.

The flash rate for the flashing beacon must comply with chapter 4L, "Flashing Beacons," of the *California MUTCD*.

The flashing beacon must allow alternating flashing wig-wag operation.

The flashing beacon must have a separate flasher unit installed in the flashing beacon control assembly.

87-7.02 MATERIALS

Flashing beacon control assembly must:

1. Have a NEMA 3R enclosure with a dead front panel and a hasp with a 7/16-inch hole for a padlock. The enclosure must have one of the following finishes:
 - 1.1. Powder coating.
 - 1.2. Hot-dip galvanized coating.
 - 1.3. Factory-applied, rust-resistant prime coat and finish coat.
2. Have barrier-type terminal blocks rated for 25 A, 600 V(ac), made of molded phenolic or nylon material and have plated-brass screw terminals and integral marking strips.
3. Include a solid state flasher complying with section 8 of NEMA standards publication no. TS 1 for 10 A, dual circuits.

87-7.03 CONSTRUCTION

Perform the conductor and operational tests for the system.

87-7.04 PAYMENT

Not Used

87-8-87-11 RESERVED

87-12 CHANGEABLE MESSAGE SIGN SYSTEMS

87-12.01 GENERAL

Section 87-12 includes specifications for constructing changeable message sign systems.

Changeable message sign system includes:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Service equipment enclosure
6. Department-furnished controller cabinet
7. Department-furnished changeable message sign
8. Department-furnished wiring harness
9. Service equipment enclosure
10. Sign disconnect

The components of a changeable message sign system are shown on the project plans.

87-12.02 MATERIALS

Not Used

87-12.03 CONSTRUCTION

Install the changeable message sign.

Connect the field wiring to the terminal blocks in the sign assembly and controller cabinet.

The Engineer provides you a list of field conductor terminations for each sign cabinet and controller cabinet.

The Department maintains the sign assemblies.

87-12.04 PAYMENT

Not Used

87-13-87-17 RESERVED

87-18 INTERCONNECTION CONDUIT AND CABLE

87-18.01 GENERAL

Section 87-18 includes specifications for constructing interconnection conduit and cable.

Interconnection conduit and cable includes:

1. Pull boxes
2. Conduit
3. Signal interconnect cables

The components of an interconnection conduit and cable are shown.

87-18.02 MATERIALS

Not Used

87-18.03 CONSTRUCTION

Test the signal interconnect cable.

Connect the signal interconnect cable to the terminal block in the controller cabinets. The Engineer provides you a list of terminations for each controller cabinet.

87-18.04 PAYMENT

Not Used

87-19 RESERVED

87-20 TEMPORARY ELECTRICAL SYSTEMS

87-20.01 GENERAL

Section 87-20 includes specifications for providing temporary electrical systems.

Obtain the Department's authorization for the type of temporary electrical system and its installation method.

A temporary system must operate on a continuous, 24-hour basis.

87-20.02 MATERIALS

87-20.02A General

Material and equipment may be new or used.

The components of a temporary system are shown on the project plans.

If you use Type UF-B cable, the minimum conductor size must be no. 12.

87-20.02B Temporary Flashing Beacon Systems

A temporary flashing beacon system consists of a flashing beacon system, wood post, generator, and photovoltaic system.

The system must comply with the specifications for a flashing beacon system in section 87-7, except it may be mounted on a wood post or a trailer.

87-20.02C Temporary Lighting Systems

A temporary lighting system consists of a lighting system, generator, and wood poles.

The system must comply with the specifications for a lighting system in section 87-2, except it may be mounted on a wood pole or a trailer.

87-20.02D Temporary Signal Systems

A temporary signal system consists of a signal and lighting system, wood poles and posts, and a generator.

System must comply with the specifications for a signal and lighting system in section 87-4, except:

1. Signal heads may be mounted on a wood pole, mast arm, tether wire, or a trailer
2. Flashing beacons may be mounted on a wood post, or a trailer

87-20.03 CONSTRUCTION

87-20.03A General

Provide electrical and telecommunication services for temporary systems. Do not use existing services unless authorized.

Provide power for the temporary electrical systems under section 12-3.33, except you may use a photovoltaic system for the temporary flashing beacon system.

Install conductors and cables in a conduit, suspended from wood poles at least 25 feet above the roadway, or use direct burial conductors and cables.

You may saw slots across paved areas for burial conductors and cables.

Install conduit outside the paved area at a minimum of 12 inches below grade for Type 1 and 2 conduit and at a minimum of 18 inches below grade for Type 3 conduit.

Install direct burial conductors and cables outside the paved area at a minimum depth of 24 inches below grade.

Place the portions of the conductors installed on the face of wood poles in either Type 1, 2, or 3 conduit between the point 10 feet above grade at the pole and the pull box. The conduit between the pole and the pull box must be buried at a depth of at least 18 inches below grade.

Place conductors across structures in a Type 1, 2, or 3 conduit. Attach the conduit to the outside face of the railing.

Mount the photoelectric unit at the top of the standard or wood post.

You may abandon in place conductors and cables in sawed slots or in conduit installed below the ground surface.

87-20.03B Temporary Flashing Beacon Systems

Install a fused-splice connector in the pull box adjacent to each flashing beacon. Wherever conductors are run overhead, install the splice connector in the line side outside of the control assembly.

87-20.03C Temporary Lighting Systems

Wherever conductors are run overhead, install the fuse splice connectors in the line side before entering the mast arm.

87-20.03D Temporary Signal Systems

You may splice conductors that run to a terminal compartment or a signal head on a pole to the through conductors of the same phase in a pull box adjacent to the pole. Do not splice conductors or cables except in a pull box or in a NEMA 3R enclosure.

The Department provides the timing for the temporary signal.

Maintain the temporary signal except for the Department-furnished controller assembly.

87-20.04 PAYMENT

Not Used

87-21 EXISTING ELECTRICAL SYSTEMS

87-21.01 GENERAL

Section 87-21 includes general specifications for performing work on existing electrical systems.

87-21.02 MATERIALS

Not Used

87-21.03 CONSTRUCTION

87-21.03A General

You may abandon unused underground conduit after pulling out all conductors and removing conduit terminations from the pull boxes.

If standards are to be salvaged, remove:

1. All components
2. Mast arms from the standards
3. Luminaires, signal heads, and signal mounting assemblies from the standards and mast arms

If the existing material is unsatisfactory for reuse and the Engineer orders you to replace it with new material, replacing the existing material with new material is change order work.

If the removed electrical equipment is to be reinstalled, supply all materials and equipment, including signal mounting assemblies, anchor bolts, nuts, washers, and concrete, needed to complete the new installation.

87-21.03B Maintaining Existing Electrical Systems

87-21.03B(1) General

Maintain the existing electrical system in working order during the progress of the work. Conduct your operations to avoid damage to the elements of the systems.

87-21.03B(2) Maintaining Existing Traffic Management System Elements During Construction

Section 87-21.02B(2) applies if a bid item for maintaining existing traffic management system elements during construction is shown on the Bid Item List.

Traffic management system elements include:

1. Ramp metering system
2. Traffic monitoring stations
3. Microwave vehicle detection system
4. Changeable message sign system
5. Extinguishable message sign system
6. Highway advisory radio system
7. Closed circuit television camera system
8. Roadway weather information system

Obtain authorization at least 72 hours before interrupting communication between an existing system and the traffic management center.

If the Engineer notifies you that an existing system is not fully operational due to your activities, repair or replace the system within 72 hours. If the system cannot be fixed within 72 hours or it is located on a structure, provide a temporary system within 24 hours until the system can be fixed. Perform a functional test of the system in the presence of the Engineer. If you fail to perform the necessary repair or replacement work, the Department may perform the repair or replacement work and deduct the cost.

If you damage an existing fiber optic cable, install a new cable such that the length of cable slack is the same as before the damage, measured from an original splice point or termination. All splices must be made using the fusion method.

You may interrupt the operation of traffic monitoring stations:

1. For 60 days if another operational traffic monitoring station is located within 3 miles
2. For 15 days if another operational traffic monitoring station is located more than 3 miles away

If a traffic monitoring station must be interrupted for longer periods than specified, provide a temporary detection system. Obtain the Department's authorization for the type of temporary system and its installation method.

87-21.03C Modifying Existing Electrical Systems

Modify electrical systems as shown.

87-21.03D Removing Existing Electrical Systems

The components to be removed are shown on the project plans.

2. The device must be re-calibrated monthly and at any time when the container shape has been deformed from its original condition or there is evidence of material build-up on the inside of the device.
3. The device must be held in a level condition during filling. Fill the device to the measure or strike-off line. Each measurement must be filled to within 1.0% of the device as-calibrated volume.
4. The device interior must be cleaned after each measurement to maintain a zero condition.

For weight proportioning, proportion RPC with a weigh hopper attached to the plant at a position which allows the addition of the RPC to the mixer truck with the conventional PCC ingredients. The plant process controller must control the proportioning of RPC to within 1.0% of its target weight.

90-9.02 MATERIALS

90-9.02A General

The quantity of RPC added to the concrete must not exceed 15 percent.

The cementitious material content of the RPC must be at least that specified for the concrete that allows the use of RPC.

Water must not be added to the RPC after batching, including in the truck mixer.

Use HSA for controlling and reducing the hydration rate of RPC.

Incorporate RPC by mixing into the concrete before arriving at the jobsite.

90-9.02B Returned Plastic Concrete

The RPC must not exceed 100 degrees F at any time.

If HSA is not used, RPC must be incorporated into the concrete before attaining initial set or within 4 hours after batching of RPC, whichever is earlier.

If HSA is used:

1. Add HSA to RPC within 4 hours after original batching.
2. Measure and record the time, dosage of HSA, and temperature of RPC when HSA is added.
3. Mix the RPC under the HSA manufacturer's instructions after adding HSA or at least 30 revolutions, whichever is greater.
4. Incorporate RPC into the concrete within 4 hours after adding HSA.

RPC must not contain:

1. Accelerating admixture
2. Fiber
3. Pigment
4. Lightweight aggregate
5. Previously returned RPC
6. Any ingredient incompatible with the resultant concrete

90-9.02C Hydration Stabilizing Admixture

HSA must comply with ASTM C494 admixture Type B or Type D.

HSA must have a proven history of specifically maintaining and extending both plasticity and set.

HSA dosage must comply with the manufacturer's instructions.

90-9.02D Production

Proportion concrete containing RPC under section 90-2.02E.

Proportion RPC by weight or by volume.

Greenstone Rd at Slate Creek Bridge Replacement
CIP No. 77137, Project No. 3605
March 5, 2019

County of El Dorado
Revised Standard Specifications
AA-196

APPENDIX B

**To the Contract Documents for
Greenstone Road at Slate Creek Bridge Replacement Project
CIP No. 77137, Contract No. 3605
Federal Aid No. BRLO – 5925(103)**

Environmental Permits

**GREENSTONE ROAD AT SLATE CREEK
BRIDGE (NO. 25C0087) REPLACEMENT PROJECT**



**Biological Assessment
California Red-Legged Frog (*Rana draytonii*)**

El Dorado County, California
Shingle Springs, California USGS 7.5-Minute Quadrangle
Section 33, Township 10 North, Range 10 East

Federal Aid Number: BRLO 5925(103)

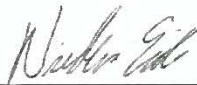
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Greenstone Road at Slate Creek
Bridge (No. 25C0087) Replacement Project
Federal Aid Number: BRLO 5925(103)
September 2015

STATE OF CALIFORNIA
Department of Transportation

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Chapter 1. Introduction

The purpose of this Biological Assessment (BA) is to review the proposed Greenstone Road at Slate Creek Bridge (No. 25C0087) Replacement Project (proposed action) in sufficient detail to determine to what extent the proposed action may result in effects on threatened, endangered, and proposed species and designated and proposed critical habitat. This BA has been prepared in accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA) (50 CFR 402; 16 U.S.C. 1536(c)) and Federal Highway Administration and California Department of Transportation (Caltrans) regulations, policies, and guidance.

El Dorado County (County) has applied for federal funding administered by Caltrans. Caltrans, acting on behalf of the Federal Highway Administration, is serving as the lead agency for purposes of consultation under the ESA and compliance with other federal laws. The U.S. Army Corps of Engineers (Corps) will need to authorize the proposed action through a Section 404 of the Clean Water Act permit. As a federal agency, the Corps will also need to document compliance with the ESA. The Corps may enter into an agreement with Caltrans to allow Caltrans to conduct consultation with the U.S. Fish and Wildlife Service (USFWS) on its behalf.

1.1. Threatened, Endangered, and Proposed Species

The following threatened and endangered species were considered during preparation of this BA (Appendix A):

- Stebbins' morning-glory (*Calystegia stebbinsii*) E¹
- Pine Hill ceanothus (*Ceanothus roderickii*) E
- Pine Hill flannelbush (*Fremontodendron californicum* ssp. *decumbens*) E
- El Dorado bedstraw (*Galium californicum* ssp. *sierrae*) E
- Layne's butterweed (*Senecio layneae*) T
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) T
- Delta smelt (*Hypomesus transpacificus*) T
- Steelhead - northern California Distinct Population Segment (*Oncorhynchus mykiss irideus*) T
- California red-legged frog (*Rana draytonii*) T

¹ E = Endangered; T = Threatened

Based on the results of fieldwork and a review of the proposed action, the only species that could be affected by the proposed action is California red-legged frog. The remaining species are not further discussed in this BA; rationale for their elimination from further consideration is presented in Appendix B.

1.2. Critical Habitat

No critical habitat has been designated or proposed for California red-legged frog or any other species in the action area. The proposed action would not affect designated or proposed critical habitat.

1.3. Consultation to Date

A list of federally listed, proposed, and candidate species with the potential to occur in the action area was obtained from the USFWS Sacramento Fish and Wildlife Office via the Information for Planning and Conservation tool on July 13, 2015 (Appendix A). Caltrans will initiate consultation with the USFWS once this BA is approved. Caltrans and the County have coordinated with the USFWS on previous bridge replacement and road improvement projects that could affect the California red-legged frog. In support of previous similar projects, the County has agreed to implement specific measures to avoid or minimize the potential for effects on California red-legged frog as part of their actions.

Chapter 2. Description of the Proposed Action

The County is proposing to replace Bridge No. 25C0087 over Slate Creek on Greenstone Road. The bridge is located approximately 1 mile south of the Greenstone Road-U.S. Highway 50 intersection and approximately 6 miles southwest of the city of Placerville in El Dorado County (Figure 1). It is in Section 33 of Township 10 North, Range 10 East on the *Shingle Springs, California 7.5-minute U.S. Geological Survey quadrangle map*. The approximate geographic coordinates of the bridge are latitude 38.68187, longitude -120.88794.

The proposed action is included in the County Capital Improvement Program and the Federal Statewide Transportation Improvement Program and is being funded by Local Highway Bridge Program funds administered by Caltrans. The existing bridge was determined to be functionally obsolete with a sufficiency rating of 54.2 out of 100. The purpose of the proposed action is to improve traffic safety conditions on a public roadway and comply with current County and American Association of State Highway and Transportation Officials guidelines by: (1) replacing a functionally obsolete bridge with a new structure that meets current standards and (2) widening the road geometry approaching the bridge from both south-bound and north-bound directions. Greenstone Road is a local rural road with a two-way travel lane that has an average daily traffic count of about 1,300 trips near the bridge. The overall objective is to improve safety and traffic operations along Greenstone Road. The proposed action is not part of a larger action, and no other actions are dependent on the proposed action for their justification. The proposed action has independent utility and is not associated with interrelated or interdependent actions.

2.1. Bridge Design

The County is proposing to replace the existing bridge with a standard two-lane bridge approximately 34 feet wide and 34 feet long. The bridge would have two 12-foot-wide travel lanes with 4-foot-wide shoulders on each side. The new bridge would be located slightly east of the existing bridge, which would straighten out the curve approaching the bridge from the north. The bridge structure type has not yet been determined. The foundation of the new bridge may consist of cast-in-drilled-hole piles or spread footings, which will be determined based on the results of a geotechnical study. The bridge abutments would be located along the banks of Slate Creek and would not be in the active channel. Rock slope protection may be placed around the new abutments to protect them from scouring and erosion. It is anticipated that the excavation for the abutments would not exceed 20 feet (approximate) below the existing ground surface.

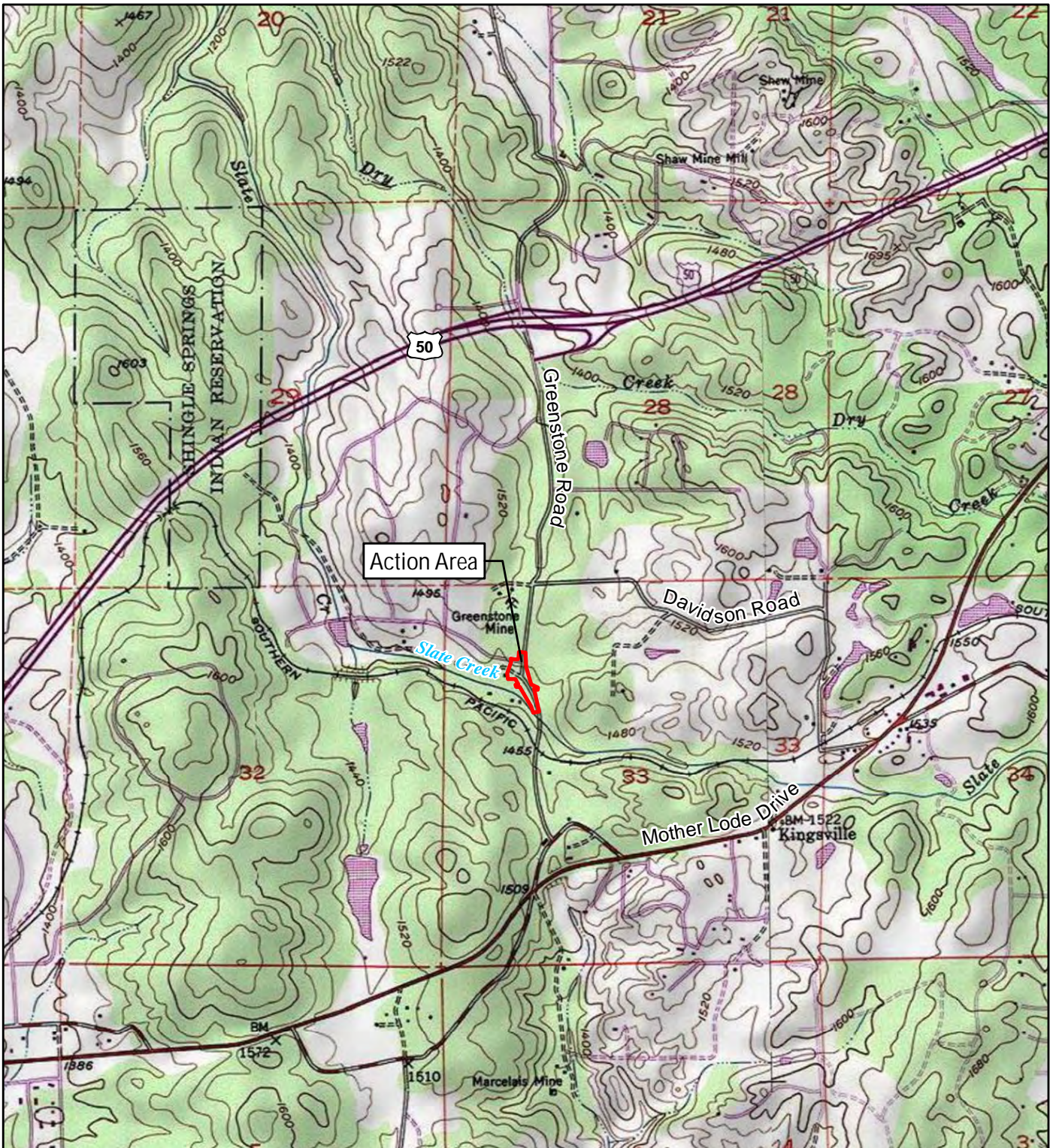
The County plans to realign the roadway approaches slightly east of the existing road and widen the approaches (from 22 feet to 32 feet) to align with the new bridge. Approximately 230 feet and 385 feet of Greenstone Road would be reconstructed to the south and north of the new bridge, respectively. As part of this realignment, cut and fill would be required along the new roadway, and a fence, utilities, and a drainage ditch may be relocated to follow the modified roadway. In addition, pavement associated with the old roadway would be removed, and the disturbed area would be restored to match adjacent conditions (e.g., grasslands). New guard rails would be installed along both sides of the new roadway north of the new bridge, extending approximately 75 feet from the bridge. Guard rails on the south side of the bridge may extend approximately 75 feet on the east side of Greenstone Road and 185 feet on the west side of Greenstone Road. The existing property fences on both sides of Greenstone Road would be relocated, extending approximately 775 feet on the eastern side of the road and 515 feet on the western side. An underground waterline along the east side of Greenstone Road would be relocated to follow the modified roadway. As part of the relocation, the pipeline would be disinfected to prevent impacts on the water supply, and temporary service disruption may occur.

2.2. Construction Methods

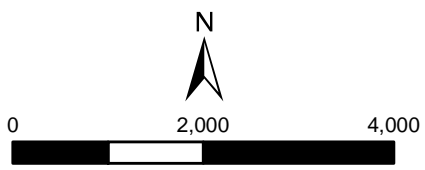
The proposed action would generally involve: tree removal; site clearing, preparation, and earthwork; utility relocation; demolition and removal of the existing bridge structure; construction of new bridge foundations, abutments, retaining structures, deck, and guardrails; widening and realignment of a segment of Greenstone Road; applying pavement overlay; and hydroseeding disturbed areas, including the former roadway. Staging would occur along the road, where feasible, and may occur on adjacent private properties to the southeast and northwest of the existing bridge (Figure 2). Vegetation removal would be necessary in the proposed location of the new bridge and along the new road alignment. Blasting is not expected but cannot be ruled out completely, depending on the nature of the subsurface rock that may be encountered. Demolished materials would be removed and disposed of offsite at an appropriate facility.

Approximately 2,600 cubic yards of imported materials would be used in construction; fill would be obtained from existing commercial sources. Areas to receive fill would be cleared, scarified, and re-compacted to minimize ground settlement under the increased loading caused by the fill. Excavation would be required at the bridge abutments, along the roadway prism, and for drainage improvements. An estimated 400 cubic yards of material would be excavated and either used for backfill onsite or properly disposed offsite.

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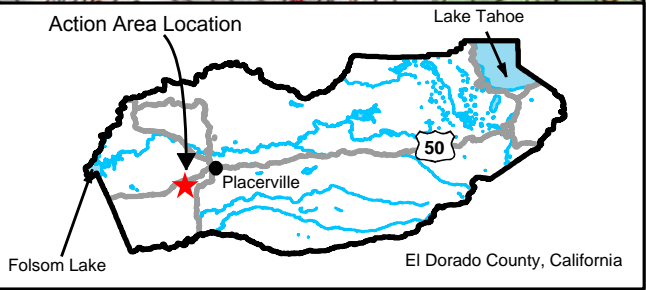


Public Land Survey
Sec. 33, T10N, R10E



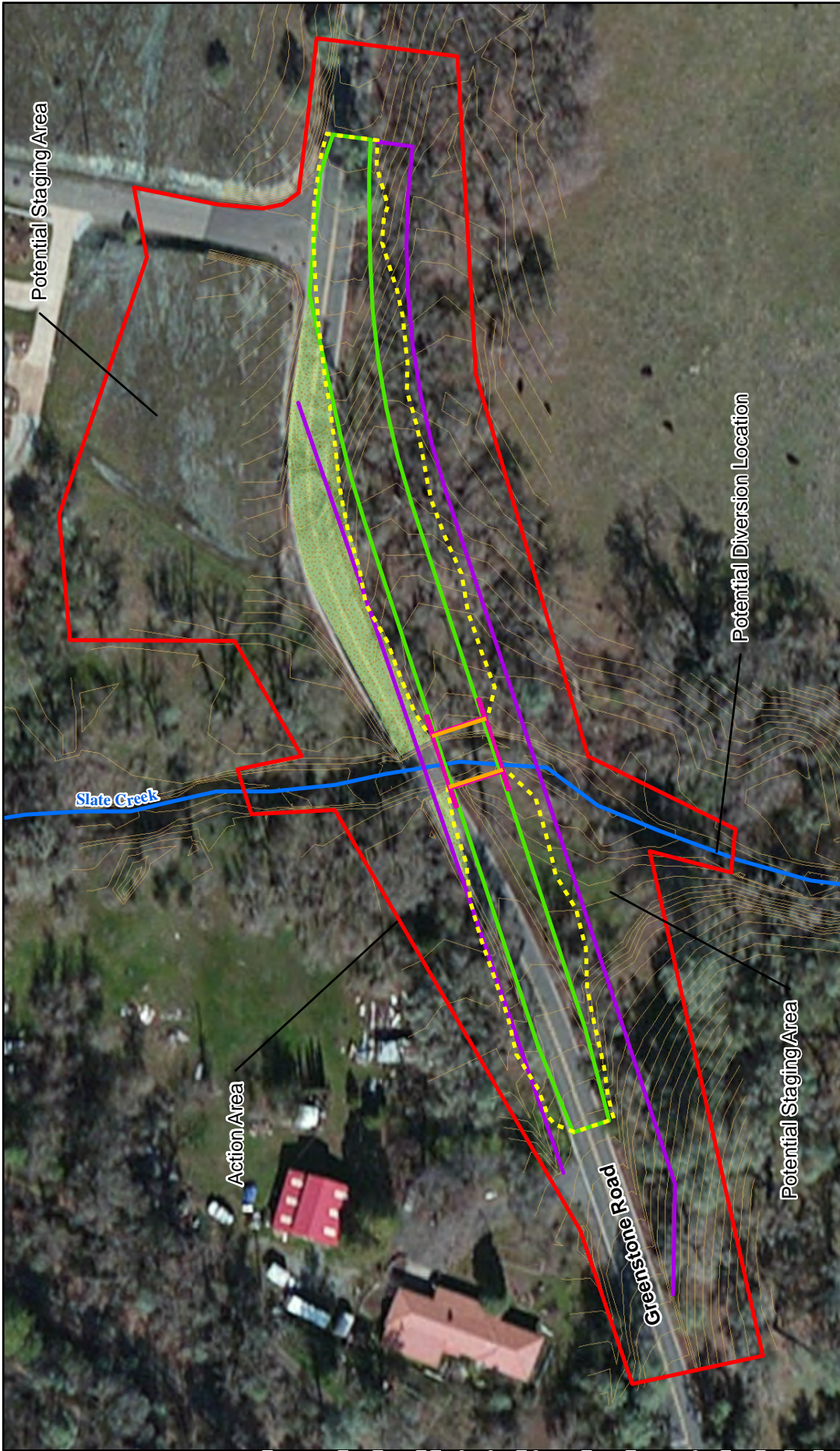
USGS 7.5 Quad:
Shingle Springs - Revised 1973

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Slate Creek Bridge (25C0087) Replacement Project

Figure 1
Action Area Location
19-0240 A 310 of 655



| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------|
| <p>Project Components</p> <ul style="list-style-type: none"> Abutment New Bridge Extent of Cut/Fill Proposed Road Alignment Road Restoration Relocated Fence Contour | <p style="text-align: center;">N</p> | <p style="text-align: center;">0 50 100 200 Feet</p> |
| <p>Greenstone Road at Slate Creek Bridge (No. 25C0087) Replacement Project</p> <p>Figure 2</p> <p>Action Area and Project Design</p> | | |

A temporary diversion dam and piping may be used to divert stream flows around the excavation areas for the new bridge foundations. The diversion dam and piping would be temporarily installed in the creek bed approximately 100-150 feet east (upstream) of the existing bridge. The diversion dam would consist of a simple dam or device and would be about 20 feet long, extending between both banks of the creek. Flexible piping would likely be used to carry stream flow through the instream work area. The piping would be sized to allow creek flows to be directly channeled and conveyed through the work area with minimal impacts at the inlet and outlet locations of the diversion piping. The diversion device would be removed after the bridge work is complete and normal stream flow would be restored. The instream work would take place when stream flows are lowest.

Construction is expected to start in 2017 or later, once all required approvals and funding have been obtained. The overall construction period would encompass up to 2.5 years. Utility relocation may be scheduled within a year prior to bridge construction or at the same time, and bridge construction and associated improvements may require two construction seasons. Greenstone Road near the bridge may be closed to through traffic during one construction season (7 months). Construction would generally take place between April 15 and October 30. Work performed in and around the creek (e.g., diversion dam, bridge construction) would be scheduled during dry months. Other work (e.g., utility relocation, paving and striping the road) outside of the creek may be scheduled at any time.

2.3. Construction Contract and Standard Measures

The County would retain a construction contractor to construct the new bridge. The contractor would be responsible for compliance with all applicable rules, regulations, and ordinances associated with proposed action activities and for implementing construction-related mitigation measures. The County would provide construction contractor oversight and management and would be responsible for verifying implementation of the mitigation measures. The contractor would construct the proposed action in accordance with the Public Contracts Code of the State of California; the State of California Department of Transportation Standard Plans and Standard Specifications; and the Contract, Project Plans, and Project Special Provisions under development by the County.

The following measures are a combination of standard and project-specific procedures and requirements applicable to construction:

- Construction contract special provisions will require that a traffic management plan be prepared. The traffic management plan will include construction staging and traffic control measures to be implemented during construction to maintain and

minimize impacts to traffic on nearby roads during construction. Minor traffic stoppages or delays on nearby roads may be allowed if necessary during project construction to provide access for construction equipment and vehicles into the action area. During one construction season, Greenstone Road may be closed to vehicle traffic. Portable changeable message signs would be used to alert travelers on nearby roads of construction activities and to direct travelers to the detour route while Greenstone Road is closed.

- Contract special provisions will require compliance with El Dorado County Air Quality Management District Rules 223, 223-1, and 223-2 to minimize fugitive dust emissions and naturally occurring asbestos hazards.
- Contractor will be required to comply with the California Air Resources Board Airborne Toxic Control Measure at Title 17 Section 93105 addressing Construction, Grading, Quarrying, and Surface Mining activities and with the Asbestos Airborne Toxic Control Measure for Surfacing Applications (California Code of Regulations, Title 17, Section 93106).
- Contract provisions will require notification of the County and compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Sections 5097.5, 5097.9 et seq., regarding the discovery and disturbance of cultural materials or human remains should any be discovered during project construction.
- Contract provisions will require compliance with the El Dorado County Grading Ordinance and Storm Water Management Plan for Western El Dorado County and implementation of best management practices (BMPs) as identified in the National Pollutant Discharge Elimination System permit and/or Storm Water Management Plan. The contractor will be required to prepare a stormwater pollution prevention plan or water pollution control plan that identifies project-specific BMPs that would be implemented in accordance with County and Caltrans requirements. BMPs may include those related to structure demolition/removal over or adjacent to water, temporary stream crossings, stream bank stabilization, clear water diversions, material equipment use over water, and others as applicable.
- Contract provisions will require a fire safety plan to prevent fires from construction operations (such as welding).

- The County or its construction contractors will conduct early coordination with law enforcement and emergency service providers to ensure minimal disruption to service during construction.
- The County and its construction contractors will comply with the State of California Standard Specifications, written by Caltrans, for public service provision.
- Access to adjacent private properties will remain open at all times during the construction period.
- The proposed action will comply with General Plan Policy 6.5.1.11 pertaining to construction noise.

2.4. Avoidance and Minimization Measures

Caltrans and the County have coordinated with the USFWS on previous bridge replacement and road improvement projects that could affect the California red-legged frog. In support of previous similar projects, the County has agreed to implement specific measures to avoid or minimize the potential for effects on California red-legged frog. The avoidance and minimization measures listed below will be implemented during construction activities associated with the proposed action.

- The County shall retain a qualified biologist familiar with California red-legged frog biology and habitat requirements to implement mitigation measures for the proposed action. The County shall submit the name and credentials of the biologist(s) to the USFWS for review and approval at least 15 days prior to the onset of construction activities.
- A USFWS-approved biologist shall conduct a California red-legged frog survey of the action area within 24 hours before the onset of vegetation removal. If California red-legged frogs are found during the survey, the approved biologist shall consult with the USFWS and ensure avoidance of the area.
- Environmental awareness training shall be conducted prior to onset of the work for construction personnel to brief them on how to recognize California red-legged frog. Construction personnel shall also be informed that if a California red-legged frog is encountered in the work area, construction must stop, and the USFWS will be contacted immediately to provide further guidance.
- Slate Creek outside the work area shall be staked, flagged, or signed to avoid encroachment by equipment and construction crews. The number of access routes, size of the staging area, and the total area of impact shall be limited to the minimum

necessary to achieve the proposed action goal. This goal includes locating access routes and construction areas outside of the creek to the maximum extent practicable. The flagged areas will confine access routes and construction areas to the minimum area necessary to complete construction and minimize the impact on potential California red-legged frog habitat.

- To avoid potential injury or mortality to California red-legged frogs using vegetated areas for cover, all initial vegetation clearing required for the proposed action (i.e., removal of small trees, shrubs, brush, and tall dense grasses) will be cut manually to ground level using hand tools (e.g., chainsaw, lopper, weed wacker) and will be removed from the work area by hand. A USFWS-approved biologist will monitor the initial vegetation clearing to ensure California red-legged frogs are not injured or killed. Once the work area has been cleared of low-growing vegetation, the removal and trimming of larger trees and shrubs and the rest of construction activities may proceed using heavy equipment and without a biological monitor present.
- If California red-legged frogs are found at any time during the work, construction will stop and the USFWS will be contacted immediately to provide further guidance.
- All refueling and maintenance of equipment and vehicles shall occur at least 50 feet from water bodies and shall not occur at a location where a spill would drain directly toward the creek. Prior to the onset of work, the County shall ensure that a spill prevention and clean-up plan is in place for prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- Appropriate BMPs to protect water quality and control erosion shall be implemented.
- During construction activities, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.
- Work areas that are temporarily disturbed shall be re-vegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area.
- Upon completion of construction activities, any diversions or barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate. Alteration of the streambed shall be minimized to the maximum extent possible.

2.5. Action Area

The action area encompasses approximately 3.5 acres, which includes the construction work area where roadway improvements and staging areas would be located, and portions of Slate Creek approximately 150 feet upstream and 100 feet downstream of the existing bridge to

account for the diversion dam, associated piping, and indirect effects on downstream aquatic habitat (Figure 2).

The action area is on the western side of the Sierra Nevada foothills. Elevations range from approximately 1,420 to 1,435 feet. The mean annual precipitation for the region is approximately 38 inches, most of which falls as rain with occasional snowfall between December and April (Western Regional Climate Center 2015). Slate Creek flows under Greenstone Road in a westerly direction and continues to the South Fork American River approximately 11 miles downstream. Dominant land uses in the vicinity are rural residential and grazing land. Two residential properties occur adjacent to the action area west of Greenstone Road.

Habitats in the action area include annual grassland, valley oak woodland, and riverine. Habitat types were characterized based on descriptions provided in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Representative photographs are provided in Appendix C.

Annual Grassland. Annual grassland is found in and adjacent to the action area. Dominant plant species include wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), soft brome (*B. hordeaceus*), dogtail grass (*Cynosurus echinatus*), hedge parsley (*Torilis arvensis*), Italian rye grass (*Festuca perennis*), and yellow star-thistle (*Centaurea solstitialis*). Wildlife species observed in the annual grassland habitat during surveys include northwestern fence lizard (*Sceloporus occidentalis occidentalis*) and California quail (*Callipepla californica*).

Valley Oak Woodland. Valley oak woodland occurs throughout the action area. Dominant tree species include valley oak (*Quercus lobata*) and blue oak (*Q. douglasii*), with ponderosa pine (*Pinus ponderosa*) and gray pine (*P. sabiniana*) dispersed throughout. Black walnut (*Juglans hindsii*) and Goodding's black willow (*Salix gooddingii*) are also found in small numbers scattered along the banks of Slate Creek. Understory plants include shrub and grassland species such as wild rose (*Rosa* sp.), poison oak (*Toxicodendron diversilobum*), Himalayan blackberry (*Rubus armeniacus*), ripgut brome, soft brome, dogtail grass, hedge parsley, and yellow star-thistle. Wildlife species observed in the habitat include turkey vulture (*Cathartes aura*), Nuttall's woodpecker (*Picoides nuttallii*), downy woodpecker (*Picoides pubescens*), and mourning dove (*Zenaida macroura*).

Riverine. Slate Creek is an intermittent stream that ranges from 10 to 35 feet wide with an average depth of 0.5 to 1.0 foot in the action area. The creek is a scoured drainage dominated by run and riffle characteristics, with cobble, gravel, and sand substrates. Vegetation within the channel east of the existing bridge is sparse, and in places the creek

banks are densely vegetated with Himalayan blackberry. Patches of fresh emergent vegetation, including seep monkey flower (*Mimulus guttatus*), Mediterranean beard grass (*Polypogon maritimus*), and northern water-plantain (*Alisma triviale*), are present on the bed of Slate Creek, west of the existing bridge. Numerous recently metamorphosed Sierran treefrogs (*Pseudacris sierra*) were observed along the banks of the creek during field surveys.

Chapter 3. Status of the Species and Critical Habitat in the Action Area

3.1. Species Background and Habitat Requirements

The California red-legged frog is the largest native frog in the western United States and is endemic to California. The USFWS designated California red-legged frog as a threatened species on May 23, 1996 (FR 61:25813). The recovery plan for the California red-legged frog was published on September 12, 2002 (U.S. Fish and Wildlife Service 2002). Critical habitat for the frog was designated on April 13, 2006 (U.S. Fish and Wildlife Service 2006) and was revised on March 17, 2010 (U.S. Fish and Wildlife Service 2010).

Historically, the California red-legged frog was commonly found from Redding, California, south to Baja California, including the Sierra Nevada and Coast Range (Jennings and Hayes 1985, Hayes and Krempels 1986). Its current range is much reduced, with most remaining populations found in isolated localities.

In the Sierra Nevada, California red-legged frogs have been known to breed in wetlands and ponds, including livestock ponds. They require cool water habitats, such as streams, and ponds with emergent and submergent vegetation (Storer 1925, Stebbins 1972). The highest densities of frogs are found in habitats with deep water pools (at least 2.5 feet deep) that support dense stands of overhanging willows and a fringe of tules or cattails (Jennings and Hayes 1994). Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergent vegetation. The key to their occurrence in these habitats is the presence of perennial, or nearly perennial waters, and the lack of introduced aquatic predators, such as crayfish (*Pacifastacus leniusculus* and *Procambarus clarkii*), bullfrogs (*Lithobates catesbeianus*), bluegill (*Lepomis macrochirus*), and other centrarchid fishes such as largemouth bass (*Micropterus salmoides*). In addition to aquatic habitats, juvenile and adult California red-legged frogs may be found in riparian vegetation near breeding areas. The species also uses small mammal burrows in or under vegetation, willow root wads, and the undersides of old boards and other debris within the riparian zone (Jennings and Hayes 1994). In the Sierra Nevada, small populations of breeding California red-legged frogs may remain as permanent residents and not disperse far from their home ponds (Tatarian 2008, Tatarian and Tatarian 2008).

Adult California red-legged frogs have been observed to breed from late November through early May after the onset of warm rains (Storer 1925, Jennings and Hayes 1994). Females attach an egg mass of 2,000 to 6,000 moderate-sized (0.08 to 0.11 inch diameter) eggs to an

emergent vegetation brace such as tule, annual grasses, or willow roots just below the water surface (Livezey and Wright 1947, Storer 1925).

Embryos of California red-legged frogs hatch 6 to 14 days after fertilization, and the resulting larvae require 3.5 to 7 months to attain metamorphosis at a total length of 2.6 to 3.4 inches (Storer 1925). Larvae are thought to graze on algae, but they are rarely observed because they are often concealed in submergent vegetation or detritus (Jennings and Hayes 1994). Most larvae metamorphose into juvenile frogs between July and September. Post-metamorphic frogs grow rapidly by feeding on a wide variety of invertebrates. Adult frogs apparently eat a variety of animal prey including invertebrates, small fishes, frogs, and small mammals (Hayes and Tennant 1985, Arnold and Halliday 1986).

The decline of the California red-legged frog is largely attributable to human activities, many of which operate cumulatively with each other and natural factors. Human activities associated with declining populations of the species include agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, impoundments, water diversions, degraded water quality, introduced predators, and exploitation for food (U.S. Fish and Wildlife Service 2002). Within the Slate Creek watershed (Weber Creek), the main activities in the past that have altered the quality of habitats include urbanization, traffic, introduction of non-native predators, and road construction. Many of these activities have resulted in the degradation, fragmentation, or loss of California red-legged frog habitat throughout its range.

3.2. Status of the Species in the Action Area

The action area is not located within designated or proposed critical habitat for California red-legged frog. The nearest critical habitat unit is ELD-1, which is located approximately 12.2 miles northeast of the action area near the community of Cedar Grove. ELD-1 encompasses approximately 59,531 acres, of which 36 percent is within the Eldorado National Forest and 64 percent is privately owned (U.S. Fish and Wildlife Service 2010). ELD-1 consists of drainages in the Weber Creek and the North Fork Cosumnes River watersheds.

Six occurrences of California red-legged frog have been recorded in El Dorado County between 1997 and 2009 according to the California Natural Diversity Database (CNDDDB), although not all of them have been verified by California Department of Fish and Wildlife (2015). The nearest known extant population of breeding frogs in the county according to the CNDDDB is located approximately 16 miles east of the action area at Spivey Pond, which is located in the Weber Creek watershed. Individuals from the Spivey Pond population are not anticipated to disperse into the action area given the distance and terrain between the two

locations. Other recorded occurrences in the county are more than 5 miles from the action area and in different watersheds, and the frog is not expected to disperse into the action area from those locations.

A variety of aquatic habitats, including perennial and ephemeral ponds, intermittent and perennial streams, and ephemeral and roadside drainages, may provide suitable breeding habitat or movement corridors for the California red-legged frog in the Slate Creek watershed. Based on a review of recent aerial photographs, approximately nine ponds are located within 1 mile of the action area and may provide suitable breeding habitat for California red-legged frog. The nearest is a perennial livestock pond, which is located approximately 900 feet to the northeast of the action area and drains to Slate Creek.

A field reconnaissance of potential habitat in the action area was conducted on June 9, 2015 to assess potential habitat in Slate Creek to support California red-legged frogs. Slate Creek in the action area lacks breeding habitat because it lacks pools more than 1 foot deep during the summer months that could support larval development. While patches of fresh emergent vegetation are present in Slate Creek, in general the creek is characterized as a scoured drainage and lacks the necessary dense emergent and submergent vegetation used by the species for breeding and larval development. Furthermore, the action area lacks significant riparian vegetation, small mammal burrows, willow root wads, and other cover sites that could serve as upland refugia used during dispersal or to avoid desiccation during movements in dry months.

In the action area, Slate Creek would more likely function as dispersal habitat for California red-legged frogs migrating through the area. Slate Creek appears to be hydrologically connected as the effluent drainage for several livestock ponds (i.e., potential breeding habitat) in the vicinity of the action area. As such, Slate Creek could be used by the frog as a point to point migration corridor between ponds during the wet season.

While Slate Creek may be considered potential dispersal habitat, it is unlikely that the frog would be found in Slate Creek because: 1) the nearest known extant population is more than 16 miles east of the action area; 2) recent observations and research indicate that small populations of California red-legged frogs may not disperse far from their home ponds (Tatarian and Tatarian 2008); 3) breeding habitat is not present in the creek within 100 feet upstream or downstream of the bridge; and 4) the ponds near the action area likely support competing species and predators (e.g., bullfrogs, fish, and birds) and would provide low quality breeding habitat for the frog. For these reasons, the potential for California red-legged frog to occur in the action area or nearby vicinity is considered to be low.

Chapter 4. Environmental Baseline and Cumulative Effects

4.1. Environmental Baseline

The action area has been primarily affected by the establishment of Greenstone Road, and rural residences upslope of and adjacent to the action area have resulted in indirect effects on the quality of aquatic and terrestrial habitats in the action area. The bridge over Slate Creek along Greenstone Road was installed in 1925. Bridge installation and road improvements in the action area modified terrestrial habitats adjacent to the creek and likely indirectly affected the quality of the aquatic habitat in the creek. The bridge spans the creek, although the northern abutment is located in the bed and bank of the creek.

Ongoing maintenance of the existing bridge and roads are generally confined to the roadway, and adjacent habitats have been minimally affected since the mid-1920s. Some vegetation removal (e.g., overhanging limbs, grass and brush along right-of-way) occurs periodically, but does not substantially affect the creek or its riparian corridor.

The development of rural residential homes upslope of and adjacent to the action area has affected the quality of terrestrial and aquatic habitats in the action area by introducing pollutants to the creek and its tributaries, increasing vehicle traffic in the area, and introducing non-native predators (e.g., dogs, cats). Also, ongoing disturbance associated with residential uses may deter frogs from dispersing through the area. These conditions reduce the suitability of the action area as habitat for California red-legged frog.

Ongoing vehicle traffic along Greenstone Road and private driveways in the action area could kill or injure frogs crossing the roads and creates an ongoing hazard to California red-legged frogs.

4.2. Cumulative Effects

Routine maintenance of Greenstone Road by the County is the only anticipated future action that could contribute to cumulative effects on California red-legged frogs in the action area. However, with implementation of the proposed action, future maintenance would be less frequent compared with the level of current and past maintenance activities given the bridge would be constructed using current building standards and would use higher quality building materials. Typical maintenance activities include: filling potholes, resurfacing portions of the roadway, maintaining barriers and side rails, and trimming or mowing vegetation. Most

of these activities would not affect aquatic or terrestrial habitat. However, vegetation maintenance (e.g., removal or trimming along the edges of the road) could result in the minor alteration of habitat and a temporary reduction of cover available in the action area.

The proposed action consists of replacing an existing functionally obsolete bridge with a new structure and would not be constructed for the purpose of facilitating or contributing to future development in the action area.

Chapter 5. Effects of the Action

The action area is not located in designated or proposed critical habitat for California red-legged frog, and the proposed action would not affect designated or proposed critical habitat. Based on available occurrence information and habitat conditions in and near the action area, as discussed in Chapter 3, California red-legged frogs are unlikely to occur in the action area and the proposed action is not expected to adversely affect California red-legged frog. However, in the unlikely event that California red-legged frog is present in the area during construction activities, the avoidance and minimization measures listed in Chapter 2 would reduce the potential for effects on the frog, as discussed below.

5.1. Direct Effects

Direct effects are those that are caused by or will result from the proposed action at the time of the proposed action (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). If California red-legged frogs are present in the action area during construction activities, direct effects could include mortality, increased risk of predation, and increased stress resulting from:

- Temporary reduction in available aquatic and upland habitat and prey base as a result of dewatering and other construction disturbance;
- Displacement from the action area due to presence of people and equipment within the creek channel and banks;
- Vegetation removal along the creek prior to installation of the bridge;
- Obstruction of movement corridors due to the presence of people and equipment within the creek channel and on the banks and use of a temporary diversion structure in the creek;
- Filling or crushing of crevices or other areas used for refuge;
- Crushing, dismemberment, and other injuries resulting from contact with construction vehicles and other construction equipment during construction activities; and
- Silting, fill, or spill of oil or other chemicals into Slate Creek or its tributary, resulting in reduced water quality.

The avoidance and minimization measures listed in Section 2.4 will be implemented by the County and its contractor to reduce the potential for these impacts during construction activities. Construction activities associated with the bridge and roadway improvements would be scheduled between April 15 and October 30, with work in and around the creek only taking place during dry months. This construction schedule is outside of the rainy

season when California red-legged frog are known to disperse overland (U.S. Fish and Wildlife Service 2002), and California red-legged frogs are unlikely to be encountered during construction. In addition, the measures ensure construction personnel receive environmental awareness training to inform the crews of the potential for the species to occur, help identify the frog if it is found, and provide them with information on what to do if the species is identified, and provide for a pre-construction survey within 24 hours prior to vegetation removal to locate any California red-legged frogs in the work area. Other measures to minimize the work done in and near the creek, including flagging and/or staking off-limits areas, and to protect water quality of the creek will also ensure impacts on the frog, if present, and its dispersal habitat are avoided or minimized. Therefore, given that it is unlikely for California red-legged frogs to be encountered in the action area (as discussed above in Section 3.2), the implementation of the avoidance and minimization measures specified in Section 2.4 would ensure direct effects on California red-legged frog as a result of the proposed action are insignificant and discountable.

5.2. Indirect Effects

Indirect effects are those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). The proposed action is a short-term construction activity (lasting two seasons and up to 5 months each season) that consists of replacing an existing functionally obsolete bridge with a new bridge. The new bridge would serve the same function as the existing bridge and would not impede flow in Slate Creek or substantially modify aquatic habitat in the action area. Some vegetation removal would be necessary around the bridge during construction, but the permanent loss of terrestrial habitat is discountable. Implementation of the proposed action would not alter habitat suitability for California red-legged frog in the action area after construction, and indirect effects associated with the proposed action would be insignificant and discountable.

5.3. Cumulative Effects

With implementation of the avoidance and minimization measures for California red-legged frog, the proposed action would not contribute to cumulative effects in the action area.

Chapter 6. Determination

Based on the effects analysis and information on California red-legged frog habitat in the action area and vicinity, the Greenstone Road at Slate Creek Bridge (No. 25C0087) Replacement Project *may affect, but is not likely to adversely affect*, California red-legged frog and will have *no effect* on designated or proposed critical habitat for California red-legged frog.

This determination is based on the following:

- California red-legged frog is unlikely to occur in the action area during the construction period, particularly when work takes place in and along the creek.
- Avoidance and minimization measures implemented prior to and during construction activities (e.g., pre-construction survey, environmental awareness training, minimizing the work area) will avoid the potential for adverse effects on California red-legged frog.
- With implementation of the measures, direct and indirect effects will be insignificant and discountable.

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Appendix A USFWS Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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Consultation Code: 08ESMF00-2015-SLI-0856

July 13, 2015

Event Code: 08ESMF00-2015-E-02736

Project Name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and

the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation

regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead. Please visit our office's website (<http://www.fws.gov/sacramento>) to view a map of office jurisdictions.

Lead FWS offices by County and Ownership/Program

| County | Ownership/Program | Species | Office Lead* |
|---------------------|---------------------------------------|---------------------------------|---------------------------|
| Alameda | Tidal wetlands/marsh adjacent to Bays | Salt marsh species, delta smelt | BDFWO |
| Alameda | All ownerships but tidal/estuarine | All | SFWO |
| Alpine | Humboldt Toiyabe National Forest | All | RFWO |
| Alpine | Lake Tahoe Basin Management Unit | All | RFWO |
| Alpine | Stanislaus National Forest | All | SFWO |
| Alpine | El Dorado National Forest | All | SFWO |
| Colusa | Mendocino National Forest | All | AFWO |
| Colusa | Other | All | By jurisdiction (see map) |
| Contra Costa | Legal Delta (Excluding ECCHCP) | All | BDFWO |
| Contra Costa | Antioch Dunes NWR | All | BDFWO |
| Contra Costa | Tidal wetlands/marsh adjacent to Bays | Salt marsh species, delta smelt | BDFWO |

| | | | |
|---------------------|--------------------------------------------|---------------------------------------------------|---------------------------|
| Contra Costa | All ownerships but tidal/estuarine | All | SFWO |
| El Dorado | El Dorado National Forest | All | SFWO |
| El Dorado | LakeTahoe Basin Management Unit | | RFWO |
| Glenn | Mendocino National Forest | All | AFWO |
| Glenn | Other | All | By jurisdiction (see map) |
| Lake | Mendocino National Forest | All | AFWO |
| Lake | Other | All | By jurisdiction (see map) |
| Lassen | Modoc National Forest | All | KFWO |
| Lassen | Lassen National Forest | All | SFWO |
| Lassen | Toiyabe National Forest | All | RFWO |
| Lassen | BLM Surprise and Eagle Lake Resource Areas | All | RFWO |
| Lassen | BLM Alturas Resource Area | All | KFWO |
| Lassen | Lassen Volcanic National Park | All (includes Eagle Lake trout on all ownerships) | SFWO |
| | | | |

| | | | |
|-------------------|------------------------------------------------|---------------------------------|---------------------------|
| Lassen | All other ownerships | All | By jurisdiction (see map) |
| Marin | Tidal wetlands/marsh adjacent to Bays | Salt marsh species, delta smelt | BDFWO |
| Marin | All ownerships but tidal/estuarine | All | SFWO |
| Mendocino | Russian River watershed | All | SFWO |
| Mendocino | All except Russian River watershed | All | AFWO |
| Napa | All ownerships but tidal/estuarine | All | SFWO |
| Napa | Tidal wetlands/marsh adjacent to San Pablo Bay | Salt marsh species, delta smelt | BDFWO |
| Nevada | Humboldt Toiyabe National Forest | All | RFWO |
| Nevada | All other ownerships | All | By jurisdiction (See map) |
| Placer | Lake Tahoe Basin Management Unit | All | RFWO |
| Placer | All other ownerships | All | SFWO |
| Sacramento | Legal Delta | Delta Smelt | BDFWO |
| Sacramento | Other | All | By jurisdiction (see map) |
| | | | |

| | | | |
|----------------------|----------------------------------------------------------------------------------------------------------|---------------------------------|-------|
| San Francisco | Tidal wetlands/marsh adjacent to San Francisco Bay | Salt marsh species, delta smelt | BDFWO |
| San Francisco | All ownerships but tidal/estuarine | All | SFWO |
| San Mateo | Tidal wetlands/marsh adjacent to San Francisco Bay | Salt marsh species, delta smelt | BDFWO |
| San Mateo | All ownerships but tidal/estuarine | All | SFWO |
| San Joaquin | Legal Delta excluding San Joaquin HCP | All | BDFWO |
| San Joaquin | Other | All | SFWO |
| Santa Clara | Tidal wetlands/marsh adjacent to San Francisco Bay | Salt marsh species, delta smelt | BDFWO |
| Santa Clara | All ownerships but tidal/estuarine | All | SFWO |
| Shasta | Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest) | All | YFWO |
| Shasta | Hat Creek Ranger District | All | SFWO |
| Shasta | Bureau of Reclamation (Central Valley Project) | All | BDFWO |
| Shasta | Whiskeytown National Recreation Area | All | YFWO |

| | | | |
|---------------|------------------------------------------------|---------------------------------|---------------------------|
| Shasta | BLM Alturas Resource Area | All | KFWO |
| Shasta | Caltrans | By jurisdiction | SFWO/AFWO |
| Shasta | Ahjumawi Lava Springs State Park | Shasta crayfish | SFWO |
| Shasta | All other ownerships | All | By jurisdiction (see map) |
| Shasta | Natural Resource Damage Assessment, all lands | All | SFWO/BDFWO |
| Sierra | Humboldt Toiyabe National Forest | All | RFWO |
| Sierra | All other ownerships | All | SFWO |
| Solano | Suisun Marsh | All | BDFWO |
| Solano | Tidal wetlands/marsh adjacent to San Pablo Bay | Salt marsh species, delta smelt | BDFWO |
| Solano | All ownerships but tidal/estuarine | All | SFWO |
| Solano | Other | All | By jurisdiction (see map) |
| Sonoma | Tidal wetlands/marsh adjacent to San Pablo Bay | Salt marsh species, delta smelt | BDFWO |
| Sonoma | All ownerships but tidal/estuarine | All | SFWO |
| | | | |

| | | | |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------|---------------------------|
| Tehama | Mendocino National Forest | All | AFWO |
| Tehama | Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest) | All | YFWO |
| Tehama | All other ownerships | All | By jurisdiction (see map) |
| Yolo | Yolo Bypass | All | BDFWO |
| Yolo | Other | All | By jurisdiction (see map) |
| All | FERC-ESA | All | By jurisdiction (see map) |
| All | FERC-ESA | Shasta crayfish | SFWO |
| All | FERC-Relicensing (non-ESA) | All | BDFWO |
| | | | |
| *Office Leads: | | | |
| AFWO=Arcata Fish and Wildlife Office | | | |
| BDFWO=Bay Delta Fish and Wildlife Office | | | |
| KFWO=Klamath Falls Fish and Wildlife Office | | | |
| RFWO=Reno Fish and Wildlife Office | | | |
| YFWO=Yreka Fish and Wildlife Office | | | |



Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Consultation Code: 08ESMF00-2015-SLI-0856

Event Code: 08ESMF00-2015-E-02736

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Project Description: The proposed action is located along along Greenstone Road at Slate Creek Bridge (lat. 38.68187, long. -120.88794) in El Dorado County, California. Under the proposed action the the current Slate Creek Bridge would be removed and a new bridge constructed. The action area totals 3.4 acres and encompasses all project components including staging areas. The proposed action would last 10 months (two construction seasons) and would only occur during the dry months.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-120.8880454301834 38.68307264992627, -120.88816881179811 38.68283814698378, -120.88846921920776 38.68287164745118, -120.88849067687987 38.682649706562415, -120.88860869407652 38.682398451895374, -120.8886569738388 38.68206344430041, -120.88823854923247 38.68205925669553, -120.88755190372466 38.681075162758056, -120.88748216629027 38.680899280714, -120.88727295398711 38.68092859441803, -120.88756263256072 38.68171168463781, -120.88734805583954 38.68169912176075, -120.88736951351166 38.68184150090509, -120.88756799697876 38.681891752300146, -120.88774502277374 38.68247801596871, -120.88775575160979 38.683043337100486, -120.8880454301834 38.68307264992627)))

Project Counties: El Dorado, CA



United States Department of Interior
Fish and Wildlife Service

Project name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Endangered Species Act Species List

There are a total of 9 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

| Amphibians | Status | Has Critical Habitat | Condition(s) |
|------------------------------------------------------------------------------------------|------------|----------------------|--------------|
| California red-legged frog (<i>Rana draytonii</i>) Population: Entire | Threatened | Final designated | |
| Fishes | | | |
| Delta smelt (<i>Hypomesus transpacificus</i>) Population: Entire | Threatened | Final designated | |
| steelhead (<i>Oncorhynchus (=salmo) mykiss</i>) Population: Northern California DPS | Threatened | Final designated | |
| Flowering Plants | | | |
| El Dorado bedstraw (<i>Galium californicum ssp. sierrae</i>) | Endangered | | |
| Layne's butterweed (<i>Senecio layneae</i>) | Threatened | | |
| Pine Hill ceanothus (<i>Ceanothus roderickii</i>) | Endangered | | |
| Pine Hill flannelbush (<i>Fremontodendron californicum ssp.</i> | Endangered | | |



United States Department of Interior
Fish and Wildlife Service

Project name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

| | | | |
|---------------------------------------------------------------------------------------------------------|------------|------------------|--|
| <i>decumbens</i> | | | |
| Stebbins' morning-glory (<i>Calystegia stebbinsii</i>) | Endangered | | |
| Insects | | | |
| Valley Elderberry Longhorn beetle (<i>Desmocerus californicus dimorphus</i>) Population: Entire | Threatened | Final designated | |



United States Department of Interior
Fish and Wildlife Service

Project name: GREENSTONE ROAD AT SLATE CREEK BRIDGE (NO. 25C0087)
REPLACEMENT PROJECT

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix B Review of Federally Listed Species

Table B-1. Review of Federally Listed Species

| Common Name Scientific Name | ESA Listing Status | General Habitat Description | General Habitat (Present/Absent) ² | Rationale |
|------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plants | | | | |
| El Dorado bedstraw <i>Galium californicum</i> ssp. <i>sierrae</i> | E | Chaparral, cismontane woodland, lower montane coniferous forest on gabbroic soils. Elevation 800 to 3,800 feet. Blooms from May–June. | A | Gabbroic soils are absent from the action area. |
| Layne's butterweed <i>Senecio layneae</i> | T | Chaparral and cismontane woodland on gabbroic soils. Elevation 650 to 3,300 feet. Blooms from April–August. | A | Gabbroic soils are absent from the action area. |
| Pine Hill ceanothus <i>Ceanothus roderickii</i> | E | Chaparral and cismontane woodlands on serpentinite or gabbroic soils. Elevation 800-2,000 feet. Blooms April-June. | HP | Cismontane woodlands with serpentine soils are present in the action area (generally north of Slate Creek). However, the plant was not observed during the survey conducted on June 9, 2015. |
| Pine Hill flannelbush <i>Fremontodendron californicum</i> ssp. <i>decumbens</i> | E | Chaparral and cismontane woodland on rocky, gabbroic or serpentinite soils. Elevation 1,400 to 2,500 feet. Blooms from April–July. | HP | Cismontane woodlands with serpentine soils are present in the action area (generally north of Slate Creek). However, the plant was not observed during the survey conducted on June 9, 2015. |
| Stebbins's morning-glory <i>Calysetegia stebbinsii</i> | E | Chaparral, cismontane woodlands on gabbroic or serpentinite soils. Elevation 600-3,600 feet. Blooms from April-July | HP | Cismontane woodlands with serpentine soils are present in the action area (generally north of Slate Creek). Known from fewer than 20 occurrences. However, the plant was not observed during the survey conducted on June 9, 2015. |
| Invertebrate | | | | |
| Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i> | T | Elderberry shrubs (<i>Sambucus nigra</i> ssp. <i>caerulea</i>) which are typically associated with riparian forests that occur along rivers and streams. | A | No elderberry shrubs were found in the action area during field survey on June 9, 2015. |
| Fish | | | | |
| Delta smelt <i>Hypomesus transpacificus</i> | T | Inhabits the Sacramento-San Joaquin Delta estuary in open, shallow, low-salinity (<1%) waters. Spawns in middle and upper reaches of Delta from late-winter to spring. | A | The action area is not in the species' known range. |
| Steelhead- northern California DPS <i>Oncorhynchus mykiss irideus</i> | T | Requires cool, swift shallow water; clean, loose gravel for spawning; and runs and suitable large pools in which to rear and over-summer. | A | The action area is not within the species' known range. The action area is above both Nimbus and Folsom Dam, which are classified as total fish barriers by CDFW. |

Table B-1. Review of Federally Listed Species

| Common Name <i>Scientific Name</i> | ESA Listing Status ¹ | General Habitat Description | General Habitat (Present/Absent) ² | Rationale |
|-----------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amphibian California red-legged frog <i>Rana draytonii</i> | T | Requires perennial or near-perennial aquatic habitats, especially for breeding: streams, freshwater pools and ponds over one foot deep with overhanging vegetation. | HP | Slate Creek could serve as a movement or dispersal corridor, and breeding habitat may be present within 1 mile of the action area. Suitable breeding habitat is not present in the action area. Nearest CNDDB occurrence is 7.4 miles southeast. |

¹Status Codes:

E = Endangered; T = Threatened

²Absent [A] means no suitable habitat present, and no further work needed. Habitat Present [HP] means general habitat is present and species may be present, unless otherwise noted.

Appendix C Representative Photographs

Photographs Taken: June 9, 2015



Photograph 1. Photograph of Slate Creek showing riverine habitat. View east of the existing bridge looking upstream to the east.



Photograph 2. Slate Creek and adjacent annual grassland, valley oak woodland, and riverine habitat. Slate Creek lacks deep pools and emergent vegetation to support breeding California red legged frog. View from south bank looking downstream (west) in the action area.



Photograph 3. Slate Creek and the existing bridge taken from north bank looking upstream (east) in the action area. Annual grassland, valley oak woodland, and riverine habitat shown.



Photograph 4. Slate Creek taken west of the existing bridge looking downstream to the west. Annual grassland and valley oak woodland upland habitat adjacent to Slate Creek. Burrows and other upland refugia are absent from the project area.



Photograph 5. Annual grassland habitat present in the northwest portion of the action area adjacent to Slate Creek.



Photograph 6. Valley oak woodlands adjacent to Greenstone Road just south of the existing bridge looking north.

**Mitigation Monitoring and Reporting Plan
for the
Greenstone Road at Slate Creek
Bridge (No. 25C0087) Replacement
Project**

**El Dorado County
Community Development Agency
Transportation Division
(CEQA Lead Agency)**

March 2016

Adopted by Board of Supervisors on: _____

Introduction

Purpose

The El Dorado County Community Development Agency, Transportation Division (County) has prepared an Initial Study (IS) and Mitigated Negative Declaration (MND) for the proposed Greenstone Road at Slate Creek Bridge (No. 25C0087) Replacement Project (proposed project). The County is developing plans to replace Bridge No. 25C0087 on Greenstone Road at Slate Creek. The proposed project is described in more detail in the IS/MND.

As described in the IS/MND, the project itself incorporates a number of measures to minimize adverse effects on the environment. The following measures will be contract provisions:

- Construction contract special provisions will require that a traffic management plan be prepared. The traffic management plan will include construction staging and traffic control measures to be implemented during construction to maintain and minimize impacts to traffic on nearby roads during construction. Minor traffic stoppages or delays on nearby roads may be allowed if necessary during project construction to provide access for construction equipment and vehicles into the project area. Greenstone Road may be closed to vehicle traffic during one construction season. Portable changeable message signs would be used to alert travelers on nearby roads of construction activities and to direct travelers to the detour route while Greenstone Road is closed.
- Contract special provisions will require compliance with El Dorado County Air Quality Management District (AQMD) Rules 223, 223-1, and 223-2 to minimize fugitive dust emissions and naturally occurring asbestos hazards.
- The contractor will be required to comply with the California Air Resources Board Airborne Toxic Control Measure at Title 17 Section 93105 addressing Construction, Grading, Quarrying, and Surface Mining activities and with the Asbestos Airborne Toxic Control Measure for Surfacing Applications (California Code of Regulations, Title 17, Section 93106).
- Contract provisions will require notification of the County and compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Sections 5097.5, 5097.9 et seq., regarding the discovery and disturbance of cultural materials or human remains should any be discovered during project construction.
- Contract provisions will require compliance with the El Dorado County Grading Ordinance and Storm Water Management Plan for Western El Dorado County and implementation of best management practices (BMPs) as identified in the National Pollutant Discharge Elimination System permit and/or Storm Water Management Plan. The contractor will be required to prepare a storm water pollution prevention plan or water pollution control plan that identifies project-specific BMPs that would be implemented in accordance with County and Caltrans requirements. BMPs may include those related to structure demolition/removal over or adjacent to water, temporary stream crossings, stream bank stabilization, clear water diversions, material equipment use over water, and others as applicable.

- Contract provisions will require a fire safety plan to prevent fires from construction operations (such as welding).
- The County or its construction contractors will conduct early coordination with law enforcement and emergency service providers to ensure minimal disruption to service during construction.
- The County and its construction contractors will comply with the State of California Standard Specifications, written by Caltrans, for public service provision.
- Access to adjacent private properties will remain open at all times during the construction period.
- The project will comply with General Plan Policy 6.5.1.11 pertaining to construction noise.

The IS/MND also identified five mitigation measures that are required to reduce potentially significant impacts on biological resources to levels that are less than significant. This Mitigation Monitoring and Reporting Plan (MMRP) describes a program for ensuring that these mitigation measures are implemented in conjunction with the project. The County, as the lead agency under the California Environmental Quality Act (CEQA), is responsible for overseeing the implementation and administration of this MMRP. The County will designate a staff member to manage the MMRP. Duties of the staff member responsible for program coordination will include conducting routine inspections and reporting activities, coordinating with the project construction contractor, coordinating with regulatory agencies, and ensuring enforcement measures are taken.

Regulatory Framework

California Public Resources Code Section 21081.6 and California Code of Regulations Title 14, Chapter 3, Section 15097 require public agencies to adopt MMRPs when they approve projects under a MND. The MMRPs must be adopted when a public agency makes its findings pursuant to CEQA so that the mitigation requirements can be made conditions of project approval.

Format of This Plan

The MMRP identifies the impacts and mitigation measures from the project IS/MND. Each impact discussed within this MMRP is numbered based on the sequence in which it is discussed in the IS/MND. The impact number corresponds with the specific mitigation measures. Mitigation measures are followed by an implementation description, the criteria used to determine the effectiveness of the mitigation, the timeframe for implementation, and the party responsible for monitoring the implementation of the measure.

Implementation of mitigation measures is ultimately the responsibility of the County; during construction, the delegated responsibility is shared by County contractors. Each mitigation measure in this plan contains a “Verified By” signature line, which will be signed by the County project manager when the measure has been fully implemented and no further actions or monitoring are necessary for the implementation or effectiveness of the measure.

Impacts and Associated Monitoring or Reporting Measures

Impact 1: **Degradation of habitats from invasive plant species.**

Mitigation Measure 1: *Implement measures to prevent the spread of invasive plant species.*

The County will require its contractor to implement the following measures to prevent the spread of invasive plant species into the project area:

- All equipment used for off-road construction activities will be weed-free prior to entering the project area.
- If project implementation calls for mulches or fill, they will be weed free.
- Any seed mixes or other vegetative material used for re-vegetation of disturbed areas will consist of locally adapted native plant materials.
- All temporary disturbance areas (e.g., staging areas) will be identified on construction drawings/plans and the boundaries will be delineated in the field with flagging prior to the initiation of construction activities.
- All temporarily disturbed areas will be returned to pre-project conditions upon completion of construction and will be re-vegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area. These areas will be properly protected from washout and erosion using appropriate erosion control devices including coir netting, hydroseeding, and revegetation. In sloped areas additional erosion control measures will be applied including erosion control blankets and biodegradable fiber rolls.

Implementation: The County will ensure its contractor implements the measures described above.

Effectiveness Criteria: The County will prepare and keep on file documentation verifying the implementation of the above referenced measures.

Timing: Construction Phase

Verified By: _____ Date: _____
County Project Manager

Impact 2: **Potential impacts on special-status plant species.**

Mitigation Measure 2: *Conduct pre-construction botanical surveys for special-status plants and protect individuals or populations in work areas.*

The County will retain a qualified botanist to conduct up to two botanical surveys prior to construction activities. The surveys will focus on potential habitat (i.e., serpentine soils) for big-scale balsamroot, Jepson's onion, and Red Hills soaproot in the project area, which primarily includes a proposed staging area west of Greenstone Road and north of Slate Creek. The survey(s) will be timed appropriately to coincide with the blooming period for the species and will be performed within one year prior to any staging or construction-related activities in the area with serpentine soils. In the event that individuals or populations of these special-status plant species are found, the County will mark the plant location(s) as an avoidance area both in the field, using flagging, staking, fencing, or

similar devices, and on construction plans. Information on the plants and avoidance area will be provided to construction crews as part of worker awareness training.

Implementation: The County will retain a botanist to implement the measures described above.

Effectiveness Criteria: The County will prepare and keep on file documentation verifying the implementation of the above referenced measures.

Timing: Pre-Construction Phase

Verified By: _____ Date: _____
County Project Manager

Impact 3: **Potential impacts on foothill yellow-legged frog and western pond turtle.**

Mitigation Measure 3: *Implement construction measures to reduce impacts on foothill yellow-legged frog and western pond turtle.*

The County and/or its contractor will implement the following measures to avoid or minimize project-related impacts on foothill yellow-legged frog and western pond turtle:

- Environmental awareness training will be conducted by a qualified biologist prior to onset of the work for construction personnel to brief them on how to recognize foothill yellow-legged frog, western pond turtle, and other special-status animals that may occur in the project area.
- To avoid potential injury or mortality to foothill yellow-legged frogs or western pond turtle using vegetated areas for cover along Slate Creek, initial vegetation clearing (i.e., removal of small trees, shrubs, brush, and tall dense grasses) along Slate Creek will be done manually using hand tools (e.g., chainsaw, lopper, weed wacker). The vegetation will be cut to ground level and be removed from the work area by hand.
- Slate Creek outside the work area will be staked, flagged, or signed to avoid encroachment by equipment and construction crews. The number of access routes, size of the staging area, and the total area of impact will be limited to the minimum necessary to achieve the proposed project goal. This goal includes locating access routes and construction areas outside of the creek to the maximum extent practicable. The flagged areas will confine access routes and construction areas to the minimum area necessary to complete construction and minimize the impact on natural habitats in the project area.
- All refueling and maintenance of equipment and vehicles will occur at least 50 feet from water bodies and will not occur at a location where a spill would drain directly toward the creek. Prior to the onset of work, the County will ensure that a spill prevention and clean-up plan is in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- Appropriate BMPs to protect water quality and control erosion will be implemented.
- During construction activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

- Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate. Alteration of the streambed will be minimized to the maximum extent possible.
- If foothill yellow-legged frogs or western pond turtles or their nests are encountered in the project area during construction and will be harmed by construction activities, work will stop in the area and the County will notify the California Department of Fish and Wildlife (CDFW). Upon authorization from CDFW, a qualified biologist may relocate the individual(s) the shortest distance possible to a location containing habitat outside of the work area. If a pond turtle nest is discovered during construction activities, a qualified biologist will flag the site and determine if construction activities can avoid affecting the nest. If the nest cannot be avoided, it will be excavated and relocated at a suitable location outside of the construction impact zone by a qualified biologist in coordination with CDFW.

Implementation: The County will retain the services of a qualified biologist to train construction crews and relocate special-status animals, if needed, and will ensure the contractor implements the measures described above.

Effectiveness Criteria: The County will prepare and keep on file documentation verifying the implementation of the above referenced measures.

Timing: Pre-Construction Phase and Construction Phase

Verified By: _____ Date: _____
County Project Manager

Impact 4: Potential impacts on nesting birds.

Mitigation Measure 4: Conduct pre-construction surveys for nesting birds and establish construction-free buffer zones around active nest sites.

The County and/or its contractor will implement the following measures to minimize or avoid project-related effects on nesting migratory and special-status birds:

- To deter cliff swallows from nesting under the existing bridge, the County will install an exclusionary device (e.g., netting) around the bridge prior to the initiation of the avian breeding season (before February 15) during the same year as bridge removal is proposed and after a qualified biologist has determined no nesting activity is present. The exclusionary device will remain in place until August 15 or until the bridge is demolished. The exclusionary device will be anchored such that swallows cannot attach their nests to the structure through gaps. If swallows begin building nests on the structure after installation of the exclusionary device, the County will coordinate with CDFW and will remove the nesting material in the presence of a qualified biologist to ensure that the destruction of an active nest does not occur. Bridge removal may be delayed until the nests are no longer active.
- Because construction activities cannot avoid the avian breeding season, the County will retain a qualified biologist to conduct a pre-construction survey of the project area and a 250-foot buffer, as access is available, to locate active bird nests and identify measures to protect the nests. The pre-construction survey will be performed between February 15 and August 31, but no more than 14 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities for 14 days or longer occurs, another pre-construction survey will be performed.

- If active nests are found during the pre-construction survey, the County will coordinate with a qualified biologist and CDFW, as necessary, on additional protection measures, such as establishment of a buffer around the nest tree. No construction activity will be conducted within this zone during the nesting season (February 15 and August 31) or until such time that the biologist determines that the nest is no longer active or the nesting activity would not be disrupted. The buffer zone will be marked with flagging, stakes, or other means to mark the boundary. All construction personnel will be notified of the existence of the buffer zone and will avoid entering the buffer zone during the nesting season.

Implementation: The County will retain the services of a qualified biologist to conduct pre-construction surveys and will ensure its contractor implements the measures described above.

Effectiveness Criteria: The County will prepare and keep on file documentation verifying the implementation of the above referenced measures.

Timing: Pre-Construction Phase and Construction Phase

Verified By: _____ Date: _____
County Project Manager

Impact 5: Discharge of fill into and disturbance to waters of the United States (Squaw Hollow Creek and adjacent wetlands).

Mitigation Measure 5: Comply with permit conditions and compensate for the loss of wetlands in the project area.

- The County will comply with the terms of a Clean Water Act Section 404 permit issued by the U.S. Army Corps of Engineers (Corps) and Section 401 water quality certification issued by the Regional Water Quality Control Board (RWQCB) for activities involving the discharge of fill material into Slate Creek, the ephemeral stream, or the wetlands swales. For activities in and along Slate Creek, the County will also comply with terms of a Streambed Alteration Agreement with the CDFW (if determined necessary by the CDFW). The actual project impacts will be calculated once final designs are available and during the permit application process. Prior to any discharge of dredged or fill material into Slate Creek, the ephemeral stream, or the wetland swales, the required permits and authorizations will be obtained from the respective agencies. All terms and conditions of the required permits and authorizations will be implemented.
- Based on the final designs, if unavoidable permanent impacts on wetlands in the project area are anticipated, the County will compensate for the loss of wetland functions through payment into an in-lieu fee program or mitigation bank identified in coordination with the Corps. The specific mitigation ratio will be identified in coordination with the Corps and will provide at least a 1:1 replacement ratio for impacts to wetlands.
- All waters of the United States temporarily affected by project construction will be restored as close as practicable to their original conditions.
- A constructed drainage ditch/channel should be placed along the eastern boundary of the new roadway alignment to convey runoff from the ephemeral stream towards Slate Creek.

Implementation: The County will submit the required documentation and comply with terms of the permits.

Effectiveness Criteria: The County will prepare and keep on file documentation verifying the implementation of the above referenced measures.

Timing: Pre-Construction Phase and Construction Phase

Verified By: _____ Date: _____
County Project Manager



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

June 29, 2018

Regulatory Division (SPK-2018-00326)

El Dorado County CDA Transportation Division
Attn: Ms. Donna Keeler
2850 Fairlane Court
Placerville, California 95667

Dear Ms. Keeler:

We are responding to your April 9, 2018, pre-construction notification for a Department of the Army (DA) Nationwide permit (NWP) for the Greenstone Road at Slate Creek Bridge Replacement project. The approximately 3.4-acre project site is located on Slate Creek, a tributary to Dry Creek, a tributary to Weber Creek, a tributary to the South Fork of the American River, Latitude 38.68187°, Longitude -120.88794°, El Dorado County, California.

Based on the information you provided to this office, the Greenstone Road at Slate Creek Bridge Replacement project involves the discharge of fill material into 0.103 acre of waters of the U.S. for the replacement of the existing Greenstone Road Bridge over Slate Creek, subject to Section 404 of the Clean Water Act. The specific activities that require DA authorization are the fill of waters associated with the realignment and replacement of the Greenstone Bridge and associated impacts related to temporarily dewatering the creek for construction access. These activities will result in the permanent effects to 0.041 acre of waters, including the permanent loss of 0.13 acre of wetlands, 0.028 acre of non-wetland waters and temporary impacts to approximately 0.062 acre waters. The proposed activities would be conducted in accordance with the *Greenstone Road at Slate Creek Bridge (No. 25C0087) Replacement Project, Figure 3-3b, Impacts to Waters of the United States* plans, dated April 2018.

We have determined that activities in waters of the U.S. associated with the project are authorized by Nationwide Permit Number 14. However, this authorization is denied without prejudice until water quality certification under Section 401 of the Clean Water Act has been issued or waived for the activities requiring a permit from this office. Once you receive water quality certification or waiver thereof, the activities are authorized and the work may proceed subject to the conditions of water quality certification, and the terms and conditions of the NWP.

You must comply with all terms and conditions of the NWP and applicable regional conditions. Information about the NWP terms and conditions and Sacramento District regional conditions for California, excluding the Lake Tahoe Basin are available on our website at www.spk.usace.army.mil/Missions/Regulatory/Permitting/NationwidePermits.aspx. You should pay particular attention to Regional Conditions B(1)(c), C(7), C(8), and C(9)(b). In addition, your work must comply with the following special conditions:

1. You shall conduct all work when the project area is naturally dewatered, in accordance with Regional Condition C(11) a dewatering plan must be submitted to and approved by this office prior before work can begin. No work shall be conducted in flowing water.

2. Prior to initiation of any construction activities within waters of the United States, you shall employ construction best management practices (BMPs) on-site to prevent any degradation to on-site waters of the United States (WOUS). All BMPs shall be in place prior to initiation of any construction activities and shall remain in place until construction is completed.

3. At least 30 days prior to initiation of construction activities in waters of the U.S. authorized by this verification, you shall notify this office in writing of the anticipated start date for the work. No later than 30 calendar days following completion of construction activities in waters of the U.S. authorized by this verification, you shall notify this office in writing that construction activities have been completed.

Within 30 days after completion of the authorized work, you must sign the enclosed *Compliance Certification* and return it to this office with the information required by Sacramento District Regional Condition C(9) for California.

This verification is valid until March 18, 2022, when the existing NWP's are scheduled to be modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date the NWP is modified, reissued, or revoked, you will have 12 months from the date of the modification, reissuance or revocation to complete the activity under the present terms and conditions. Failure to comply with the general and regional conditions of this NWP, or the project-specific special conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback on this permit action including your interaction with our staff and processes. For more information about our program or to complete our Regulatory Program national customer service survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Please refer to identification number SPK-2018-00326 in any correspondence concerning this project. If you have any questions, please contact Mr. Jesse Stovall at the Regulatory Division, California South Section, 1325 J Street, Room 1350 Sacramento, California 95814-2922, by email at Jesse.T.Stovall@usace.army.mil, or telephone at (916) 557-7506.

Sincerely,

Marc A. Fugler
Regulatory Senior Project Manager
California South Section

Enclosures

cc: (w/o encls)

Ms. Donna Keeler, El Dorado County Community Development Services,
donna.keeler@edcgov.us

Ms. Stephanie Tadlock, Storm Water and Water Quality Certification Unit, Central Valley
Regional Water Quality Control Board (5S), stephanie.tadlock@waterboards.ca.gov

Ms. Tina Bartlett, California Department of Fish and Wildlife, R2CEQA@wildlife.ca.gov

Mr. Mark Wuestehube, Stantec, mark.wuestehube@stantec.com

COMPLIANCE CERTIFICATION

Permit File Name: Greenstone Road at Slate Creek Bridge Replacement

Action ID: SPK-2018-00326

Nationwide Permit Number: 14

Permittee: El Dorado County CDA Transportation Division
Attn: Ms. Donna Keeler
2850 Fairlane Court
Placerville, California 95667

County: El Dorado County

Date of Verification: June 29, 2018

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Regulatory Division
California South Section
1325 J Street, Room 1350
Sacramento, California 95814-2922
DLL-CESPK-RD-Compliance@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the U.S. Army Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

Permittee Signature

Date



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

5 July 2018

Donna Keeler
El Dorado County Community Development Agency
2850 Fairlane Court
Placerville, CA 95667

CLEAN WATER ACT SECTION 401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION, EL DORADO COUNTY COMMUNITY DEVELOPMENT AGENCY, GREENSTONE BRIDGE PROJECT (WDID #5A09CR00189), EL DORADO COUNTY

This Order responds to the 6 April 2018 application submitted by the El Dorado County Community Development Agency (Applicant) for the Water Quality Certification of the Greenstone Bridge Project (Project), permanently impacting 0.041 acres of waters of the United States and the state of California.

This Order serves as certification of the subject Project permitted by the United States Army Corps of Engineers' Nationwide Permit #14 under Section 401 of the Clean Water Act, and a Waste Discharge Requirement under the Porter-Cologne Water Quality Control Act and State Water Board Order 2003-0017-DWQ.

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Order serves as a Water Quality Certification (Certification) action that is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Section 3867 of the California Code of Regulations.
2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed pursuant to Section 3855(b) of the California Code of Regulations, and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under Section 3860(c) of the California Code of Regulations.
4. This Certification is no longer valid if the Project (as described) is modified, or coverage under Section 404 of the Clean Water Act has expired.

KARL E. LONGLEY SCD, P.E., CHAIR | PATRICK PULUPA, ESQ., EXECUTIVE OFFICER

1685 E Street, Fresno, CA 93706 | www.waterboards.ca.gov/centralvalley



5. All reports, notices, or other documents required by this Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.
 - (a) For a corporation: by a responsible corporate officer such as: 1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; 2) any other person who performs similar policy or decision-making functions for the corporation; or 3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - (b) For a partnership or sole proprietorship: by a general partner or the proprietor.
 - (c) For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

6. Any person signing a document under Standard Condition number 5 shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

TECHNICAL CERTIFICATION CONDITIONS:

In addition to the above standard conditions, the Applicant shall satisfy the following:

1. The Applicant shall notify the Central Valley Water Board in writing seven (7) days in advance of the start of any work within waters of the United States.
2. Except for activities permitted by the United States Army Corps of Engineers under Section 404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
3. The Applicant shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed Project shall be adequately informed and trained regarding the conditions of this Certification.
4. The Applicant shall perform surface water sampling¹:
 - a) when performing any in-water work, including during water diversion activities;
 - b) in the event that Project activities result in any materials reaching surface waters; or
 - c) when any activities result in the creation of a visible plume in surface waters.

¹ Sampling is not required in wetlands, where the entire wetland is being permanently filled; provided there is no outflow connecting the wetland to surface waters.

The sampling requirements in Table 1 shall be conducted upstream out of the influence of the Project, and approximately 300 feet downstream of the work area. The sampling frequency may be modified for certain projects with written approval from Central Valley Water Board staff.

Table 1:

| Parameter | Unit | Type of Sample | Minimum Sampling Frequency | Required Analytical Test Method |
|-----------|----------------|----------------|------------------------------------|---------------------------------|
| Turbidity | NTU | Grab | Every 4 hours during in-water work | (1, 2) |
| pH | Standard Units | Grab | Every 4 hours during in-water work | (1, 2) |

⁽¹⁾ Pollutants shall be analyzed using the analytical methods described in 40 Code of Federal Regulations Part 136; where no methods are specified for a given pollutant, the method shall be approved by Central Valley Water Board staff.

⁽²⁾ A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring shall be maintained onsite.

A surface water monitoring report shall be submitted within two weeks of initiation of in-water activity, and every two weeks thereafter. In reporting the sampling data, the Applicant shall arrange the data in tabular form so that the sampling locations, date, constituents, and concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the Project complies with Certification requirements. The report shall include surface water sampling results, visual observations, and identification of the turbidity increase in the receiving water applicable to the natural turbidity conditions specified in the turbidity criteria below.

If no sampling is required, the Applicant shall submit a written statement stating, "No sampling was required" within two weeks of initiation of in-water construction, and every two weeks thereafter.

5. The Project is located within the jurisdiction of the Central Valley Water Board. Receiving waters and groundwater potentially impacted by this Project are protected in accordance with the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised July 2016 (Basin Plan). The Basin Plan includes water quality standards, which consist of existing and potential beneficial uses of waters of the state, water quality objectives to protect those uses, and the state and federal antidegradation policies. Turbidity limits are based on water quality objectives contained in the Basin Plan and are part of this Certification as follows:

- a) Activities shall not cause turbidity increases in surface water to exceed:
 - i. where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTUs;
 - ii. where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
 - iii. where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
 - iv. where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and

- v. where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Appropriate averaging periods may be applied, provided that beneficial uses will be fully protected. Averaging periods may only be used with prior permission of the Central Valley Water Board Executive Officer.

- b) Activities shall not cause the pH in surface waters to be depressed below 6.5 nor raised above 8.5.
6. The Applicant shall notify the Central Valley Water Board immediately if the above criteria for turbidity, pH, or other water quality objectives are exceeded.
 7. In-water work shall occur during periods of low flow and no precipitation.
 8. Use of a diversion dam and pipeline, as described in the application, shall be installed to ensure downstream flows are maintained below the construction area.
 9. Activities shall not cause visible oil, grease, or foam in the receiving water.
 10. Refueling of equipment within the floodplain or within 300 feet of the waterway is prohibited. If critical equipment must be refueled within 300 feet of the waterway, spill prevention and countermeasures must be implemented to avoid spills. Refueling areas shall be provided with secondary containment including drip pans and/or placement of absorbent material. No hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, or other construction-related potentially hazardous substances should be stored within a floodplain or within 300 feet of a waterway. The Applicant must perform frequent inspections of construction equipment prior to utilizing it near surface waters to ensure leaks from the equipment are not occurring and are not a threat to water quality.
 11. The Applicant shall develop and maintain onsite a project-specific Spill Prevention, Containment and Cleanup Plan outlining the practices to prevent, minimize, and/or clean up potential spills during construction of the Project. The Plan must detail the Project elements, construction equipment types and location, access and staging, and construction sequence.
 12. The discharge of petroleum products, any construction materials, hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, raw cement, concrete, asphalt, paint, coating material, drilling fluids, or other construction-related potentially hazardous substances to surface water and/or soil is prohibited. In the event of a prohibited discharge, the Applicant shall notify the Central Valley Water Board Contact within 24-hours of the discharge.
 13. Silt fencing, straw wattles, or other effective management practices must be used along the construction zone to minimize soil or sediment along the embankments from migrating into the waters of the United States through the entire duration of the Project.
 14. The use of netting material (e.g., monofilament-based erosion blankets) that could trap aquatic dependent wildlife is prohibited within the Project area.
 15. All areas disturbed by Project activities shall be protected from washout and erosion.

16. All temporarily affected areas shall be restored to pre-construction contours and conditions upon completion of construction activities.
17. All materials resulting from the Project shall be removed from the site and disposed of properly.
18. Hydroseeding shall be performed with California native seed mix approved by the California Department of Fish and Wildlife.
19. If the Project will involve land disturbance activities of one or more acres, or where the Project disturbs less than one acre but is part of a larger common plan of development that in total disturbs one or more acres, the Applicant shall obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2009-0009-DWQ for discharges to surface waters comprised of storm water associated with construction activity.
20. The Applicant shall comply with all United States Fish and Wildlife Service requirements.
21. The Conditions in this Certification are based on the information in the attached "Project Information Sheet" and the application package. If the actual project, as described in the attached Project Information Sheet and application package, is modified or changed, this Certification is no longer valid until amended by the Central Valley Water Board.
22. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under state and federal law. The applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.
 - (a) If the Applicant or a duly authorized representative of the Project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil liability, for each day of violation, and/or criminal liability.
 - (b) In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require the Applicant to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
 - (c) The Applicant shall allow the staff of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the Project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the Project.

NOTIFICATIONS AND REPORTS:

23. The Applicant shall provide a Notice of Completion (NOC) no later than 30 days after the Project completion. The NOC shall demonstrate that the Project has been carried out in accordance with the Project description in the Certification and in any approved amendments. The NOC shall include a map of the Project location(s), including final boundaries of any on-site restoration area(s), if appropriate, and representative pre and post construction photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.
24. The Applicant shall submit all notifications, submissions, materials, data, correspondence, and reports in a searchable Portable Document Format (PDF). Documents less than 50 MB must be emailed to: centralvalleyfresno@waterboards.ca.gov. In the subject line of the email, include the Central Valley Water Board Contact, Project name, and WDID number as shown in the subject line above. Documents that are 50 MB or larger must be transferred to a disk and mailed to the Central Valley Water Board Contact.

CENTRAL VALLEY WATER BOARD CONTACT:

Debra Mahnke, Water Resource Control Engineer
Central Valley Regional Water Quality Control Board
1685 E Street
Fresno, CA 93706
debra.mahnke@waterboards.ca.gov
(559) 445-6281

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA):

On 19 July 2016, the County of El Dorado, as lead agency, adopted an Initial Study/Mitigated Negative Declaration (IS/MND) (State Clearinghouse (SCH) No. 2016042006) for the Project and filed a Notice of Determination (NOD) at the State Clearinghouse on 1 May 2018. The Central Valley Water Board is a responsible agency under CEQA (Pub. Resources Code, § 21069) and in making its determinations and findings, must presume that the County of El Dorado's certified environmental document comports with the requirements of CEQA and is valid. (Pub. Resources Code, § 21167.3.) The Central Valley Water Board has reviewed and considered the environmental document and finds that the environmental document prepared by the County of El Dorado addresses the Project's water resource impacts. (Cal. Code Regs., tit. 14, § 15096, subd. (f).)

WATER QUALITY CERTIFICATION:

I hereby issue an Order certifying that the proposed discharge from the County of El Dorado, Greenstone Bridge Project (WDID #5A09CR00189) will comply with the applicable provisions of Section 301 ("Effluent Limitations"), Section 302 ("Water Quality Related Effluent Limitations"), Section 303 ("Water Quality Standards and Implementation Plans"), Section 306 ("National Standards of Performance"), and Section 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. Through this Order, this discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste

Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)".

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on: a) the discharge being limited and all proposed mitigation being completed in compliance with the conditions of this Certification, the County of El Dorado's application package, and the attached Project Information Sheet; and b) compliance with all applicable requirements of the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised July 2016.

Any person aggrieved by this action may petition the State Water Resources Control Board to review the action in accordance with California Water Code § 13320 and California Code of Regulations, title 23, § 2050 and following. The State Water Resources Control Board must receive the petition by 5:00 p.m., 30 days after the date of this action, except that if the thirtieth day following the date of this action falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Resources Control Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.



for Patrick Pulupa
Executive Officer

Enclosure: Project Information Sheet

Attachment: Project Maps

cc: Distribution List, see Page 8

DISTRIBUTION LIST

cc: (w/ enclosure):

Sam Ziegler (Electronic Copy Only)
U.S. Environmental Protection Agency, Region 9
Ziegler.Sam@epa.gov

Jesse Stovall (Electronic Copy Only)
United States Army Corps of Engineers
Sacramento District Headquarters
SPKRegulatoryMailbox@usace.army.mil

Patricia Cole (Electronic Copy Only)
United States Fish & Wildlife Service
patricia_cole@fws.gov

Department of Fish and Wildlife, Region 2 (Electronic Copy Only)
R2LSA@wildlife.ca.gov

CWA Section 401 WQC Program (Electronic Copy Only)
Division of Water Quality
State Water Resources Control Board
Stateboard401@waterboards.ca.gov

Stephanie Tadlock (Electronic Copy Only)
Central Valley Regional Water Quality Control Board
Stephanie.Tadlock@waterboards.ca.gov

Bill Jennings
CA Sportfishing Protection Alliance
3536 Rainer Ave.
Stockton, CA 95204

Mark Wuestehube (Electronic Copy Only)
Stantec
Mark.wuestehube@stantec.com

PROJECT INFORMATION SHEET

Application Date: 6 April 2018

Applicant: Donna Keeler
El Dorado County Community Development Agency
2850 Fairlane Court
Placerville, CA 95667

Project Name: Greenstone Bridge Project

WDID Number: WDID #5A09CR00189

Date on Public Notice: 13 April 2018

Date Application Deemed Complete: 26 June 2018

Type of Project: Transportation

Project Location: Greenstone Road at Slate Creek, approximately 1 mile south of U.S. Highway 50 and 6 miles southwest of the city of Placerville.
Latitude: 38.68187°, Longitude: -120.88794°

County: El Dorado

Receiving Water(s) (hydrologic unit): Slate Creek, tributary to Weber Creek, tributary to South Fork American River, Sacramento Hydrologic Basin, American River Hydrologic Unit #514.31, South Fork American HA, Weber Creek HSA

Water Body Type: Intermittent stream, ephemeral stream, and wetlands

Designated Beneficial Uses: The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised July 2016 (Basin Plan) has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include, but are not limited to: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND); Hydropower Generation (POW); Groundwater Recharge (GWR); Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Preservation of Biological Habitats of Special Significance (BIOL); Rare, Threatened, or Endangered Species (RARE); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); and Wildlife Habitat (WILD). A comprehensive and specific list of the beneficial uses applicable for the project area can be found at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml.

Project Description: The Project includes construction of a new two-lane bridge approximately 34 feet wide and 34 feet long, with two 11-foot-wide travel lanes and 4-foot-wide shoulders. The new bridge will be located slightly east of the existing bridge to straighten out the curve approaching the bridge from the north. The project also includes the replacement and reconstruction of roadway approaches that will allow a smooth transition between the new bridge and the existing roadway.

Project activities will include: roadway alignment, vegetation clearing, temporary stream flow diversion, bridge construction, channel contouring and erosion control activities (filter fabric and rock slope protection), and site rehabilitation.

Project construction is anticipated to begin in spring/summer 2019. In-stream work within Slate Creek is anticipated to last approximately 60 working days. The actual schedule may deviate depending on the schedule for securing required funding and approvals.

Proposed Mitigation to Address Concerns: Best management practices will be implemented to protect water quality, as described in the application.

Excavation/Fill Area: Approximately 0.041 acre will be permanently impacted by the Project by placement of 98 cubic yards of soil, rock, and imported fill.

Dredge Volume: None

California Integrated Water Quality System Impact Data:

Table 2: Impacts from Fill and/or Excavation Activities

| Aquatic Resource Type | Temporary | | | Permanent | | | | | |
|------------------------|-----------|-------------|-------------|-----------------------|-------------|-------------|------------------------------------------|-------------|-------------|
| | | | | Physical Loss of Area | | | Degradation of Ecological Condition Only | | |
| | Acres | Cubic-yards | Linear-feet | Acres | Cubic-yards | Linear-feet | Acres | Cubic-yards | Linear-feet |
| Jurisdictional wetland | 0.001 | 2 | -- | 0.013 | 75 | -- | -- | -- | -- |
| Intermittent Stream | 0.061 | 3 | 148 | 0.018 | 18 | 123 | -- | -- | -- |
| Ephemeral Stream | -- | -- | -- | 0.010 | 5 | 163 | -- | -- | -- |

United States Army Corps of Engineers Permit Type: Nationwide Permit #14

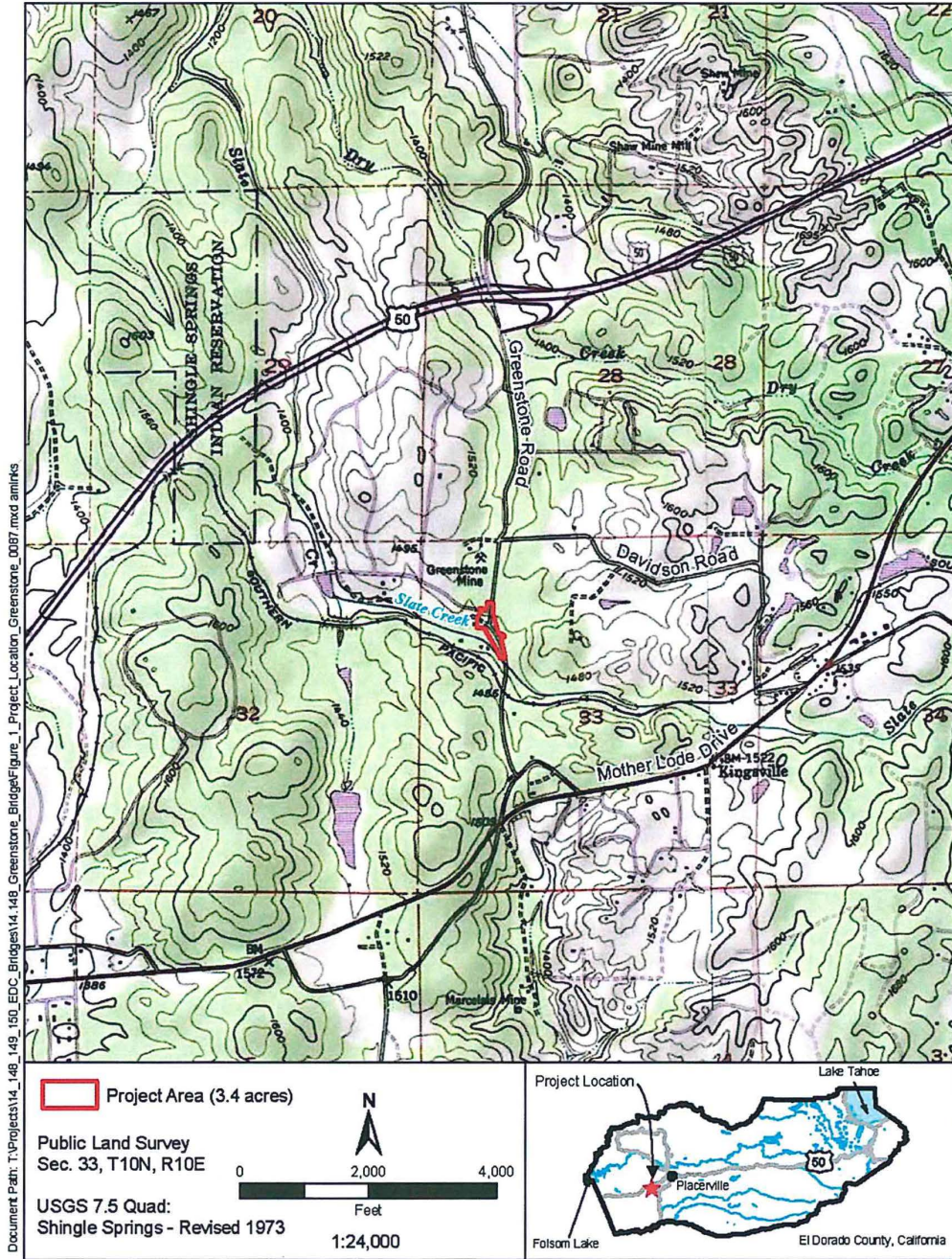
California Department of Fish and Wildlife Lake or Streambed Alteration Agreement:
The Applicant applied for a California Department of Fish and Wildlife Streambed Alteration Agreement.

Possible Listed Species: N/A

Compensatory Mitigation: Not required for permanent impact less than 0.1 acre.

Application Fee Provided: Total fees of \$1,500 have been submitted to the Central Valley Water Board as required by Section 3833(b)(3)(A) and Section 2200(a)(3) of the California Code of Regulations.

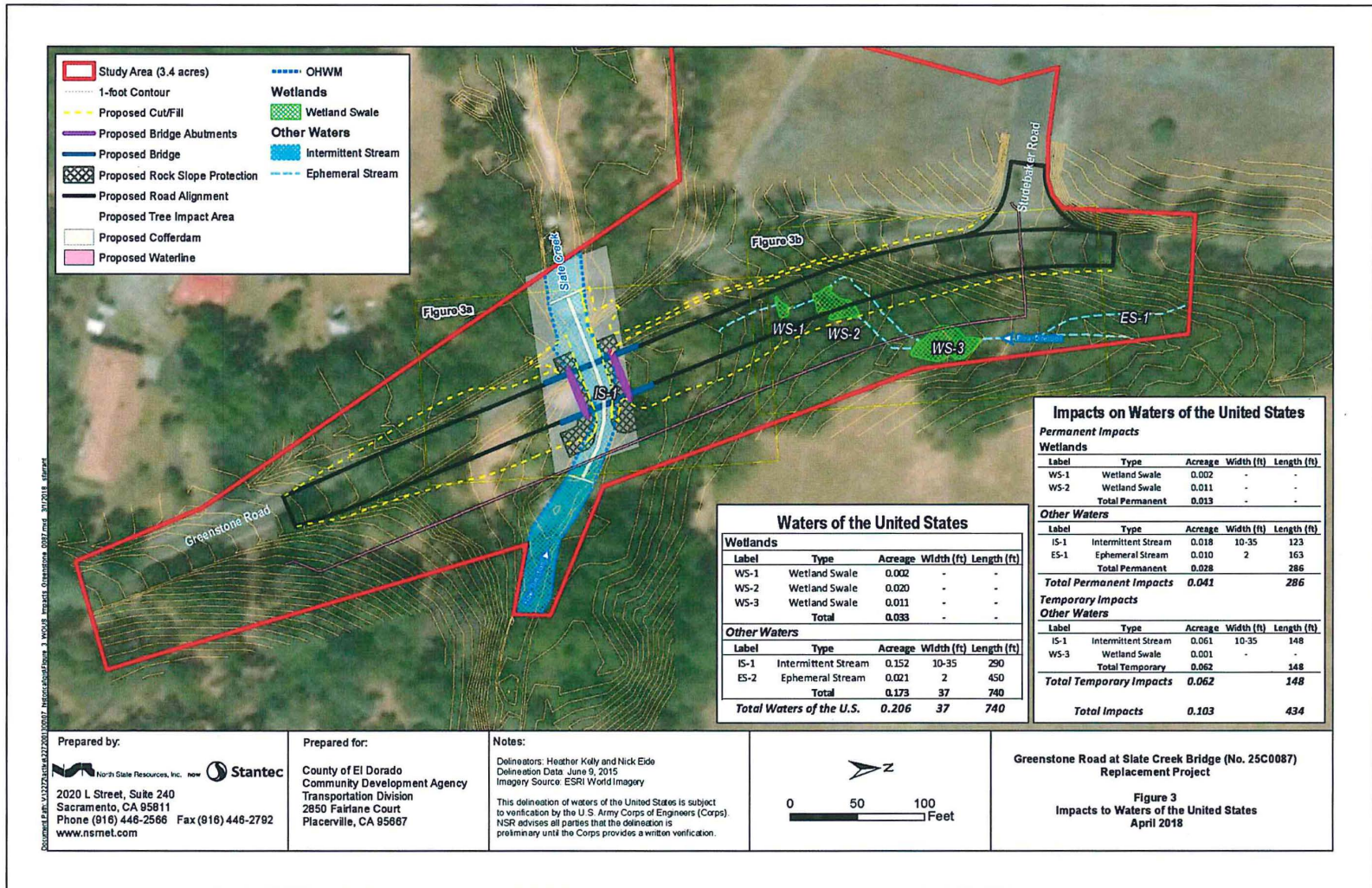
Attachment 1- Project Maps
 El Dorado County Community Development Agency
 Greenstone Bridge Project



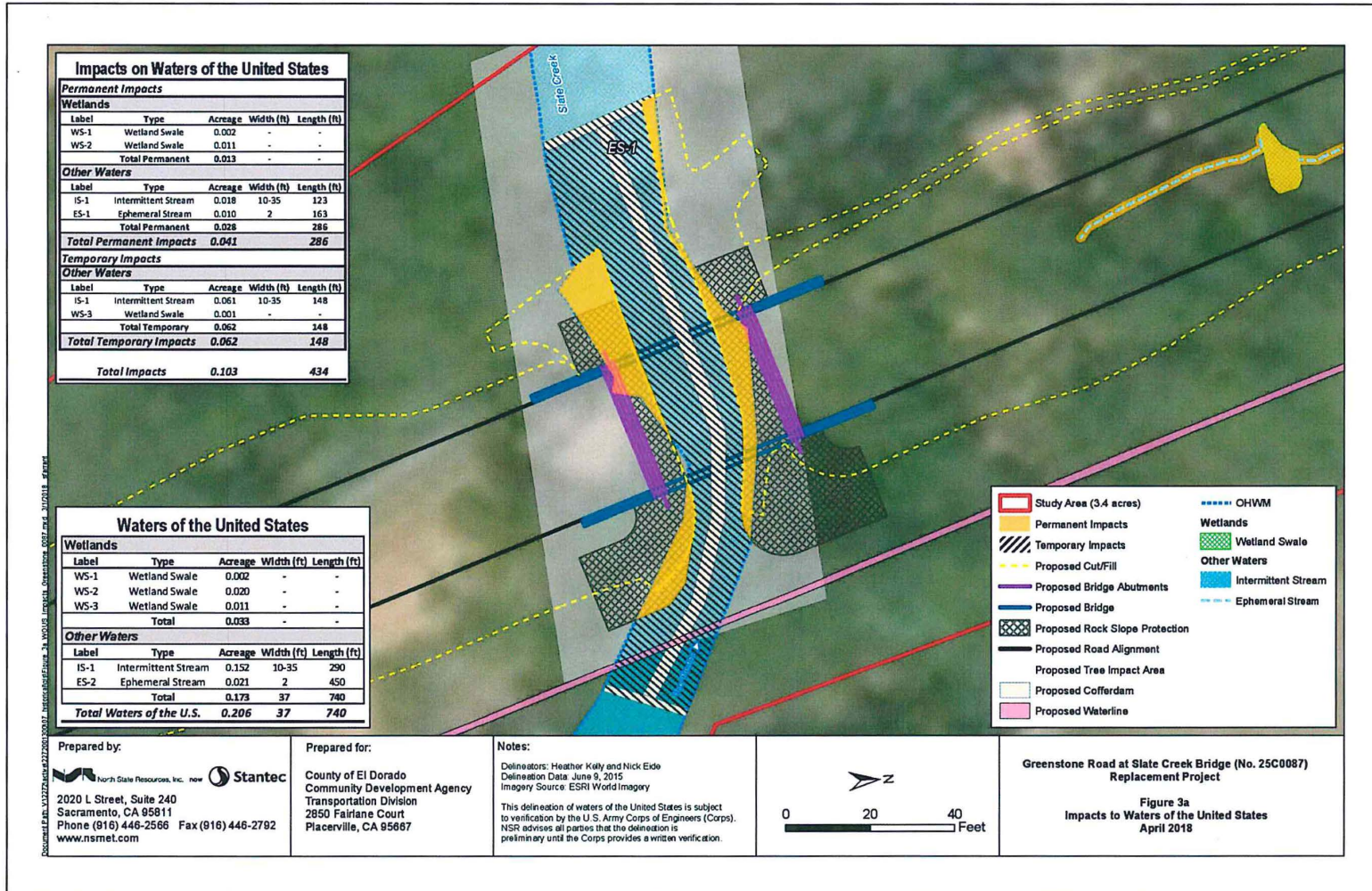
Slate Creek Bridge (25C0087) Replacement Project

Figure 1
 Project Location

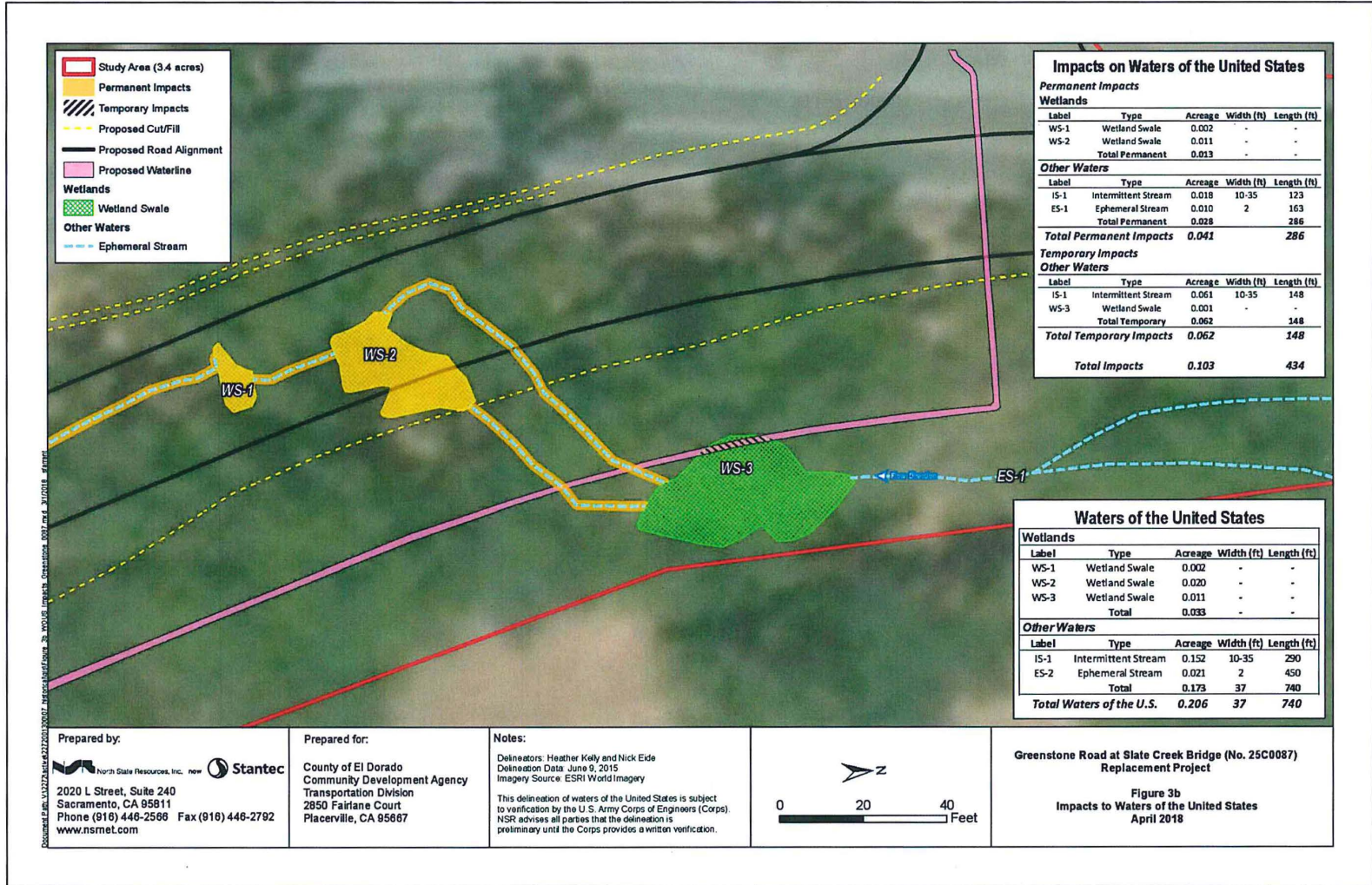
Attachment 1- Project Maps
 El Dorado County Community Development Agency
 Greenstone Bridge Project



Attachment 1- Project Maps
 El Dorado County Community Development Agency
 Greenstone Bridge Project



Attachment 1- Project Maps
 El Dorado County Community Development Agency
 Greenstone Bridge Project





California Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
(916) 358-2900
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director



OCT 18 2018

Date

Donna Keeler
El Dorado County Community Development Services
2850 Fairlane Court
Placerville, CA 95667

**Final Lake or Streambed Alteration Agreement
Notification No. 1600-2018-0093-R2
Greenstone Road at Slate Creek Bridge Replacement**

Dear Ms. Keeler:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Greenstone Road at Slate Creek Bridge Replacement Project (Project). Before the California Department of Fish and Wildlife (CDFW) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, CDFW acting as a responsible agency filed a Notice of Determination (NOD) within five working days of signing the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration prepared by the lead agency.

Under CEQA, the filing of an NOD triggers a 30-day statute of limitations period during which an interested party may challenge the filing agency's approval of the Project. You may begin the Project before the statute of limitations expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this letter, please contact Gabriele Quillman, Environmental Scientist at (916) 358-2955 or by email at gabriele.quillman@wildlife.ca.gov.

Sincerely,

Jeff Drongesen
Environmental Program Manager

ec: Gabriele Quillman, Environmental Scientist
gabriele.quillman@wildlife.ca.gov

Conserving California's Wildlife Since 1870

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2018-0093-R2; VERSION 2
SLATE CREEK

EL DORADO COUNTY COMMUNITY DEVELOPMENT SERVICES
GREENSTONE ROAD AT SLATE CREEK BRIDGE REPLACEMENT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and El Dorado County Community Development Services (Permittee), as represented by Rafael Martinez.

RECITALS

WHEREAS, pursuant to Fish and Game Code section 1602, Permittee notified CDFW on April 9, 2018 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to Fish and Game Code section 1603, CDFW has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in this Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed this Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with this Agreement.

PROJECT LOCATION

The project is located at Slate Creek, in the County of El Dorado, State of California; Latitude 38.681870°, Longitude -120.887940°; in the northwest quarter of Section 33, Township 10N, Range 10E, U.S. Geological Survey (USGS) map *Shingle Springs, California*, Mt. Diablo base and meridian; approximately one mile south of U.S. Highway 50 and approximately six miles southwest of the city of Placerville. For a map showing the project's location, see **Exhibit A**.

PROJECT DESCRIPTION

The project consists of replacing the existing Greenstone Road Bridge over Slate Creek with a new bridge and realigning and widening portions of Greenstone Road approaching the bridge from the north and south. An underground waterline to the east of Greenstone Road will also be relocated to follow the modified roadway. The new bridge will be a standard two-lane bridge, approximately 34 feet wide and 34 feet long,

with 11-foot-wide lanes and 4-foot-wide shoulders on each side. The realigned portion of Greenstone Road will be shifted slightly to the east to straighten a curve just north of the bridge, and the new bridge will be accordingly located slightly east of the existing bridge.

The bridge will be constructed of cast in place reinforced concrete, with a foundation of spread footings. Abutments will be located along the banks of Slate Creek, outside of the active channel. For a map of the project site, See **Exhibit B**.

If necessary, a temporary diversion dam will be installed approximately 100-150 feet upstream of the existing bridge and piping will divert flows around the project area and back into the stream at a downstream location. For temporary stream diversion details, see **Exhibit C**.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: nesting and migratory birds, resident fish, amphibians including foothill yellow-legged frog, and reptiles including western pond turtle.

The adverse effects the project could have on the fish or wildlife resources identified above include: nest failure due to increased noise, vibrations, and human presence; injury or mortality of individual animals due to crushing by heavy equipment, increased sedimentation and turbidity; loss of riparian habitat; and changes in water pH due to concrete leachate.

The project will temporarily impact approximately 0.061 acre of Slate Creek and will permanently impact approximately 0.018 acre of Slate Creek. Approximately 0.22 acre of oak woodland will be permanently impacted, including the removal of twelve (12) oak trees and two (2) pines.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make this Agreement, any extensions and amendments to this Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to CDFW personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of this Agreement and any extensions and amendments to this Agreement to all persons who will be working on the project at the project site on behalf of

Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

- 1.3 Notification of Conflicting Provisions. Permittee shall notify CDFW if Permittee determines or learns that a provision in this Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, CDFW shall contact Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that CDFW personnel may enter the project site at any time to verify compliance with this Agreement.
- 1.5 Does Not Authorize "Take". This Agreement does not authorize "take" of any California Endangered Species Act (CESA) listed species. Take is defined in Fish and Game Code section 86, as hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture, or kill. If there is potential for take of any listed species to occur, Permittee shall consult with CDFW as outlined in Fish and Game Code section 2050 et seq.
- 1.6 Nesting and Migratory Birds. Sections 3503, 3503.5, and 3513 of the Fish and Game Code stipulate the following: Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto; Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the orders *Falconiformes* or *Strigiformes* (birds-of-prey) to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto; and Section 3513 states that it is unlawful to take or possess any migratory nongame bird except as provided by the rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act (MBTA).

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Nesting Birds. If vegetation removal and/or ground disturbing activities begin between February 1 and August 31, then a nesting bird survey shall be conducted no more than three (3) days prior to the start by a qualified biologist. All active nests shall be marked following the survey to avoid destruction by equipment, and a non-disturbance buffer shall be established around the nest. The size of the non-disturbance buffer and any other restrictions shall be determined based upon the life history of the individual species, including their sensitivity to noise, vibration, ambient levels of human activity and general disturbance, the current site conditions (screening vegetation, terrain, etc.) and the various project-related activities necessary to implement the project. If a lapse in project-related work of 15 days or longer occurs, another survey shall be required before project work can

be reinitiated. If, during the course of carrying out the project, an active nest is identified or becomes established that was not previously identified, a buffer or installation of appropriate barriers shall be established between the construction activities and the active nest so that nesting activities are not interrupted. The buffer shall be delineated and shall be in effect throughout construction or until the young have fledged and are foraging independently of their parents.

- 2.2 Foothill Yellow-Legged Frog. Prior to starting project activities, Permittee shall submit to CDFW for review and approval their protocol for foothill yellow-legged frog (*Rana boylei*) surveys. After the survey protocol is approved by CDFW and prior to initiation of construction or ground disturbing activities, a qualified biologist familiar with the species shall survey the site for foothill yellow-legged frog adults, tadpoles, and egg masses. If foothill yellow-legged frogs, tadpoles, or egg masses are found in the work area, Permittee shall contact CDFW to determine how to proceed in compliance with CESA.
- 2.3 Qualified Biologist. Permittee shall submit to CDFW, in writing, the name, qualifications, business address and contact information of the proposed Qualified Biologist(s) specifically tasked with monitoring compliance of the terms and conditions in this agreement. Permittee shall obtain CDFW's advanced written approval of the Qualified Biologist(s) before the project begins.
- 2.4 Special Status Species encountered during work. If the Permittee encounters any special status species during construction, work shall be suspended, CDFW notified, and conservation measures shall be developed in agreement with CDFW prior to re-initiating the activity. If during the conduct of project activities, the Permittee encounters any species listed as threatened or endangered, rare or a candidate species pursuant to CESA, work shall be suspended, and CDFW notified. Work may not re-initiate until the Permittee has consulted with CDFW and can demonstrate compliance with CESA.
- 2.5 Leave Wildlife Unharmd. Permittee shall allow any wildlife that is encountered during the course of construction to leave the construction area unharmed.
- 2.6 Demarcate Work Area to Avoid Vegetation. Permittee shall consider and avoid vegetation to the greatest extent possible when demarcating the work area. Vegetation shall not be removed or damaged beyond the work area, except for trimming with hand tools to the extent necessary to gain access to the work sites. Permittee shall not remove any trees over four (4) inches in diameter at breast height from the stream bed, banks, or channel without prior written approval from CDFW, except as allowed by this Agreement.

Work Period

- 2.7 Work Period in Low Rainfall / Dry Weather Only. Permittee shall restrict the work period within and adjacent to the stream to periods of low rainfall (less than ¼" per

24 hour period) and periods of dry weather (with less than a 20% chance of rain). Permittee shall initiate all erosion control measures prior to all storm events. Revegetation, restoration and erosion control work is not confined to this work period. Permittee shall monitor the National Weather Service (NWS) 72-hour forecast for the project area. No work shall occur during a dry-out period of 24 hours after rainfall of at ½" or greater per 24-hour period.

Erosion and Sedimentation Control

- 2.8 **Stream Diversion**. If work within the wetted portion of the channel stream is unavoidable, Permittee shall divert the stream flow around or through the work area during project activities, while maintaining appropriate flows in the natural channel for aquatic species upstream and downstream of the work area. Permittee shall restore normal flows to the stream immediately upon completion of work. Water diversion activities shall be conducted in a way that does not cause stranding or drying to native fish and/or amphibians, their eggs, or their larvae. No more than two (2) days prior to implementation of any stream diversion, a survey shall be conducted by a Qualified Biologist to determine the presence of any resident salmonid fry, amplexing amphibians, tadpoles, egg masses, or other aquatic vertebrates. If egg masses or larvae are present then **diversion of the stream is not allowed**. Non-native, invasive species are excluded from this protection.
- 2.9 **Entrainment of Aquatic Life**. Permittee shall install exclusion devices (i.e., nets, screens, etc.) on any pumps, pipes, or other similar objects utilized during project activities to avoid entrainment of aquatic species.
- 2.10 **Best Management Practices**. Permittee shall actively implement Best Management Practices (BMPs) to prevent erosion and the discharge of sediment and pollutants into streams during project activities. BMPs shall be monitored and repaired if necessary to ensure maximum erosion, sediment, and pollution control. Permittee shall prohibit the use of erosion control materials potentially harmful to fish and wildlife species, such as mono-filament netting (found in materials such as straw wattles/fiber rolls or erosion control matting) or similar material, within and adjacent to the work area. All fiber rolls, straw wattles, and/or hay bales utilized within and adjacent to the project site shall be free of nonnative plant seed. **Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread.**
- 2.11 **Stabilize Bare Soil**. Permittee shall seed loose or compacted soil areas in need of stabilization and disturbed areas of the stream bed, bank, and channel with a locally native seed mix, unless otherwise agreed upon with CDFW. Permittee shall apply seed mix to such sites as soon as possible after project activities in those

areas cease. Following placement of the seed mix, Permittee shall cover the seeded area with broadcast straw, jute netting, coconut fiber blanket or similar erosion control blanket.

- 2.12 Erosion Control Monitoring. Permittee shall monitor erosion control measures during and after each storm event and repair and/or replace ineffective measures immediately.
- 2.13 Water Diversion Plan. If flowing water is present when construction is scheduled to begin, Permittee shall submit a detailed water diversion plan to CDFW for review and approval prior to starting construction.

Debris and Waste

- 2.14 Remove Cleared Material from Watercourse. Permittee shall replace all excavated sediment, vegetation, and any other material in the excavation site or remove it from the area and deposit where it cannot re-enter the stream.
- 2.15 No Dumping. Permittee and all of its contractors, subcontractors, and employees shall not dump any litter or construction debris within the stream, or where it may pass into the stream.
- 2.16 Remove Temporary Flagging, Fencing, and Barriers. Permittee shall remove all temporary flagging, fencing, and/or barriers from the project area and vicinity of the stream immediately upon completion of project activities.
- 2.17 Location of Spoil Sites. Permittee shall not place spoils within a stream or locations that may be subjected to high storm flows, where spoil may be washed back into a stream, or where it may impact streambed habitat, aquatic or riparian vegetation.

Equipment and Vehicles

- 2.18 Minimize Vehicle Parking. Permittee shall ensure that vehicles may enter and exit the work area as necessary for project activities, but may not be parked overnight within ten (10) feet of the drip line of any trees; nor shall vehicles be parked where mechanical fluid leaks may potentially enter the stream.
- 2.19 Operating Equipment and Vehicle Leaks. Permittee shall check and maintain any equipment or vehicles driven and/or operated within or adjacent to the stream daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat.
- 2.20 Stationary Equipment Leaks. Permittee shall ensure that stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to the stream are positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak.

- 2.21 Equipment Maintenance and Fueling. Permittee shall not conduct equipment maintenance or fueling within or near the creek where petroleum products or other pollutants from the equipment may enter the creek's bed, bank, or channel.
- 2.22 Equipment Storage. Permittee shall ensure that staging and storage areas for equipment, materials, fuels, lubricants and solvents, are located outside of the creek's bed, banks, and channel.

Concrete and Hazardous Materials

- 2.23 Isolate Wet Concrete from Stream. Even if water is not present, the Permittee shall ensure that any structure cast in place is completely bermed and isolated to contain any wet cement. The pH of hot concrete may be as high as 13 which is toxic to wildlife. The berm may be made of sandbags or dirt, but it shall be lined with plastic to prevent any material from seeping past the berm. Permittee shall maintain the berm in place until the concrete is fully cured.
- 2.24 No Pouring in Advance of Rain. **Permittee shall not pour any concrete or any cement product if measurable rain is forecasted within 10 days.** If any concrete is poured after October 15, or if measurable rain may fall 11 to 15 days after pouring, Permittee shall add a quick cure ingredient to the concrete mix to ensure a faster set or drying time.
- 2.25 Concrete – Designated Monitor. At all times when Permittee is pouring or working with wet concrete, there shall be a designated monitor onsite to inspect the containment structures and ensure that no concrete or other debris enters into the channel outside of those structures.
- 2.26 Hazardous Materials. Permittee shall prevent all debris, soil, silt, bark, slash, sawdust, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, wildlife, or riparian habitat resulting from the project related activities from contaminating the soil and/or entering the stream.

3. Compensatory Measures

To compensate for adverse impacts to fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

- 3.1 Offsite Habitat Restoration. The Permittee shall compensate for the removal of twelve (12) oak trees and two (2) pine trees from 0.22 acre of wooded habitat by purchasing a minimum of 0.66 credit for restoration of floodplain riparian habitat from the Cosumnes Floodplain Mitigation Bank, or equivalent as agreed to in

writing by CDFW. The Permittee shall provide mitigation banking receipts showing proof of purchase to CDFW prior to starting project activities.

4. Reporting Measures

Permittee shall meet each reporting requirement described below.

- 4.1 Work Notification. Permittee shall notify CDFW at least five days prior to project commencement. Upon completion of the project activities described in this Agreement, Permittee shall digitally photograph the work area and the photographs shall be submitted to CDFW. Notification shall be made as described in the Contact Information section below.

CONTACT INFORMATION

Any communication that Permittee or CDFW submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or CDFW specifies by written notice to the other.

To Permittee:

Rafael Martinez, Director
El Dorado County Community Development Services
2850 Fairlane Court
Placerville, CA 95667
Phone: (530) 621-7533
Email: rafael.martinez@edcgov.us

Contact:
Mark Wuestehube
2595 Ceanothus Ave., Suite 182
Chico, CA 95973
Phone: (530) 345-4552 x203
Email: mark.wuestehube@stantec.com

To CDFW:

California Department of Fish and Wildlife
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program
Notification #1600-2018-0093-R2
Phone: (916) 358-2885

Fax: (916) 358-2912
Email: R2LSA@wildlife.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of this Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that this Agreement authorizes.

This Agreement does not constitute CDFW's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

CDFW may suspend or revoke in its entirety this Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with this Agreement.

Before CDFW suspends or revokes this Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before CDFW suspends or revokes this Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused CDFW to issue the notice.

ENFORCEMENT

Nothing in this Agreement precludes CDFW from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking this Agreement.

Nothing in this Agreement limits or otherwise affects CDFW's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with, from obtaining any other permits or authorizations that might be required under, other federal, state, or local laws or regulations before beginning the project or an activity related to it. For example, if the project causes take of a species listed as threatened or endangered under the Endangered Species Act (ESA), such take will be unlawful under the ESA absent a permit or other form of authorization from the U.S. Fish and Wildlife Service or National Marine Fisheries Service.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the Fish and Game Code including, but not limited to, Fish and Game Code sections 2050 *et seq.* (threatened and endangered species), section 3503 (bird nests and eggs), section 3503.5 (birds of prey), section 5650 (water pollution), section 5652 (refuse disposal into water), section 5901 (fish passage), section 5937 (sufficient water for fish), and section 5948 (obstruction of stream).

Nothing in this Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

CDFW may amend this Agreement at any time during its term if CDFW determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend this Agreement at any time during its term, provided the amendment is mutually agreed to in writing by CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of this Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter CDFW approves the transfer or assignment in writing.

The transfer or assignment of this Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with Fish and Game Code section 1605, subdivision (b), Permittee may request one extension of this Agreement, provided the request is made prior to the expiration of this Agreement's term. To request an extension, Permittee shall submit to CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's

current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW shall process the extension request in accordance with Fish and Game Code section 1605, subdivisions (b) through (e).

If Permittee fails to submit a request to extend this Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project this Agreement covers (Fish & G. Code § 1605, subd. (f)).

EFFECTIVE DATE

This Agreement becomes effective on the date of CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable Fish and Game Code section 711.4 filing fee listed at <https://www.wildlife.ca.gov/Conservation/CEQA/Fees>.

TERM

This Agreement shall expire **five years following CDFW's signature**, unless it is terminated or extended before then. All provisions in this Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after this Agreement expires or is terminated, as Fish and Game Code section 1605, subdivision (a)(2) requires.

EXHIBITS

The documents listed below are included as exhibits to this Agreement and incorporated herein by reference.

- A. Project Location
- B. Project Site Map
- C. Stream Diversion Details

AUTHORITY

If the person signing this Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project this Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify CDFW in accordance with Fish and Game Code section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR EL DORADO COUNTY COMMUNITY
DEVELOPMENT SERVICES**



Rafael Martinez
Director

10/9/18

Date

FOR DEPARTMENT OF FISH AND WILDLIFE



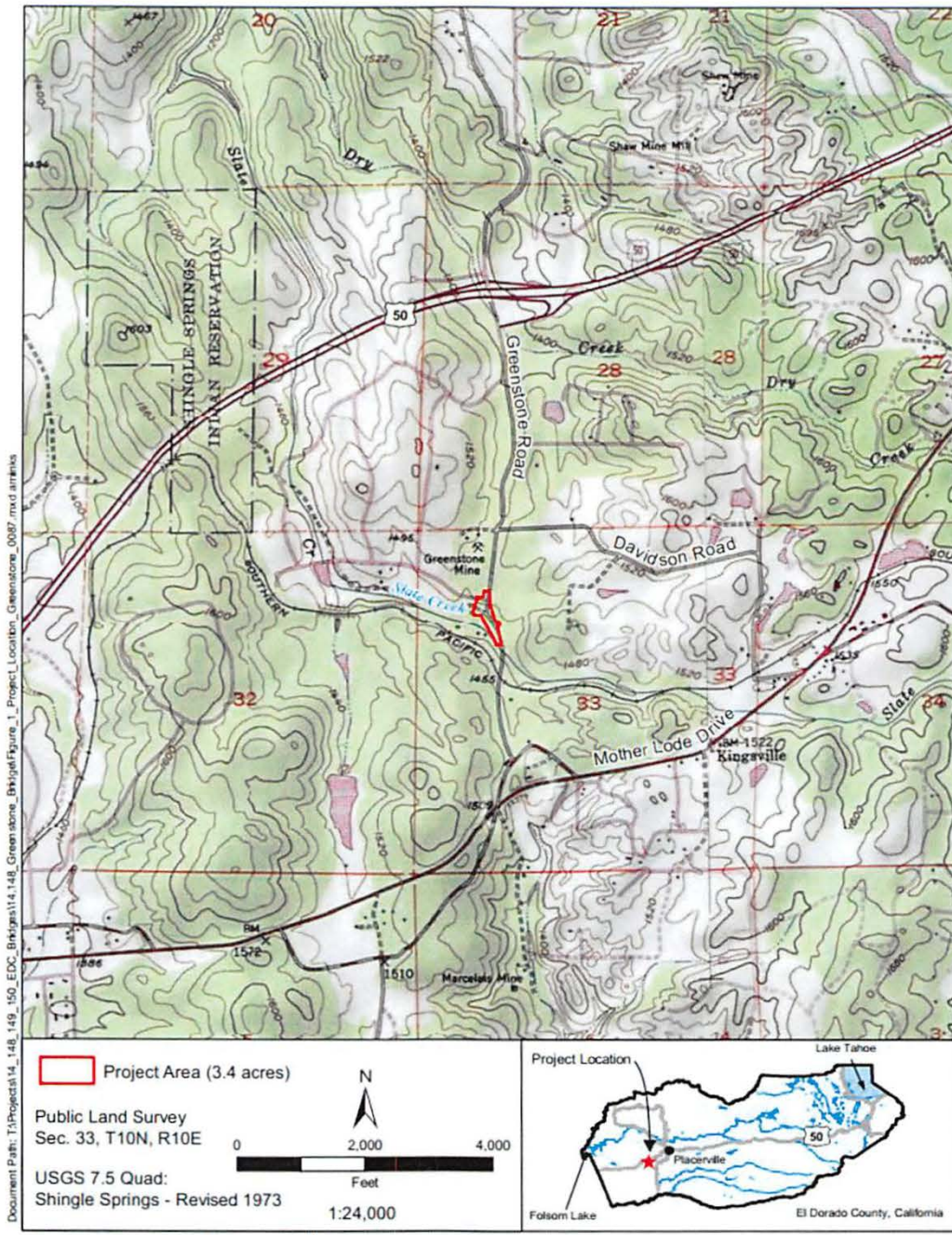
Tina Bartlett
Regional Manager

10/18/18

Date

Prepared by: Gabriele Quillman
Environmental Scientist

Exhibit A: Project Location



Slate Creek Bridge (25C0087) Replacement Project

Figure 1
Project Location

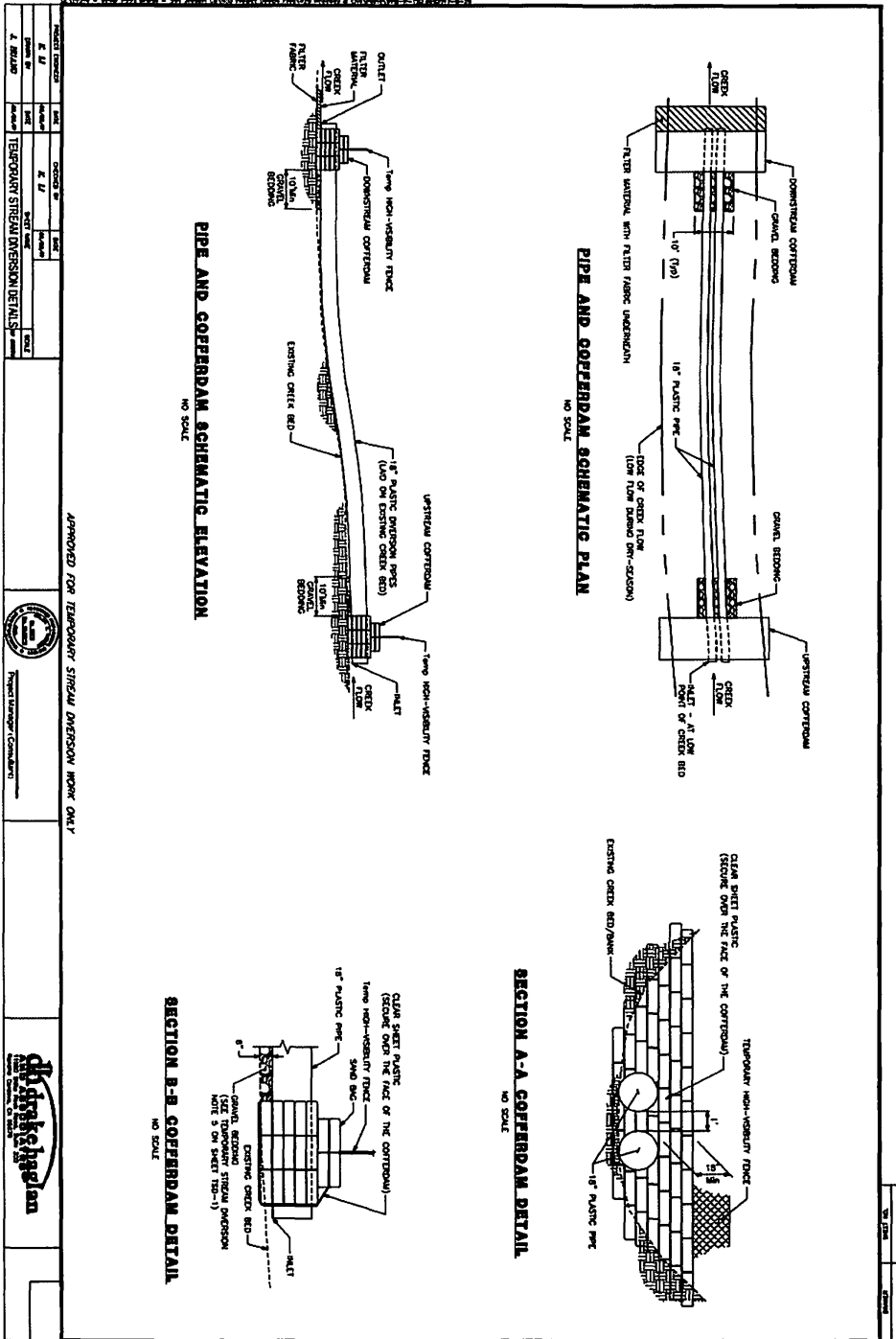
Exhibit B: Project Site Map



State Creek Bridge (25C0087) Replacement Project

Figure 2
Project Design

Exhibit C: Stream Diversion Details

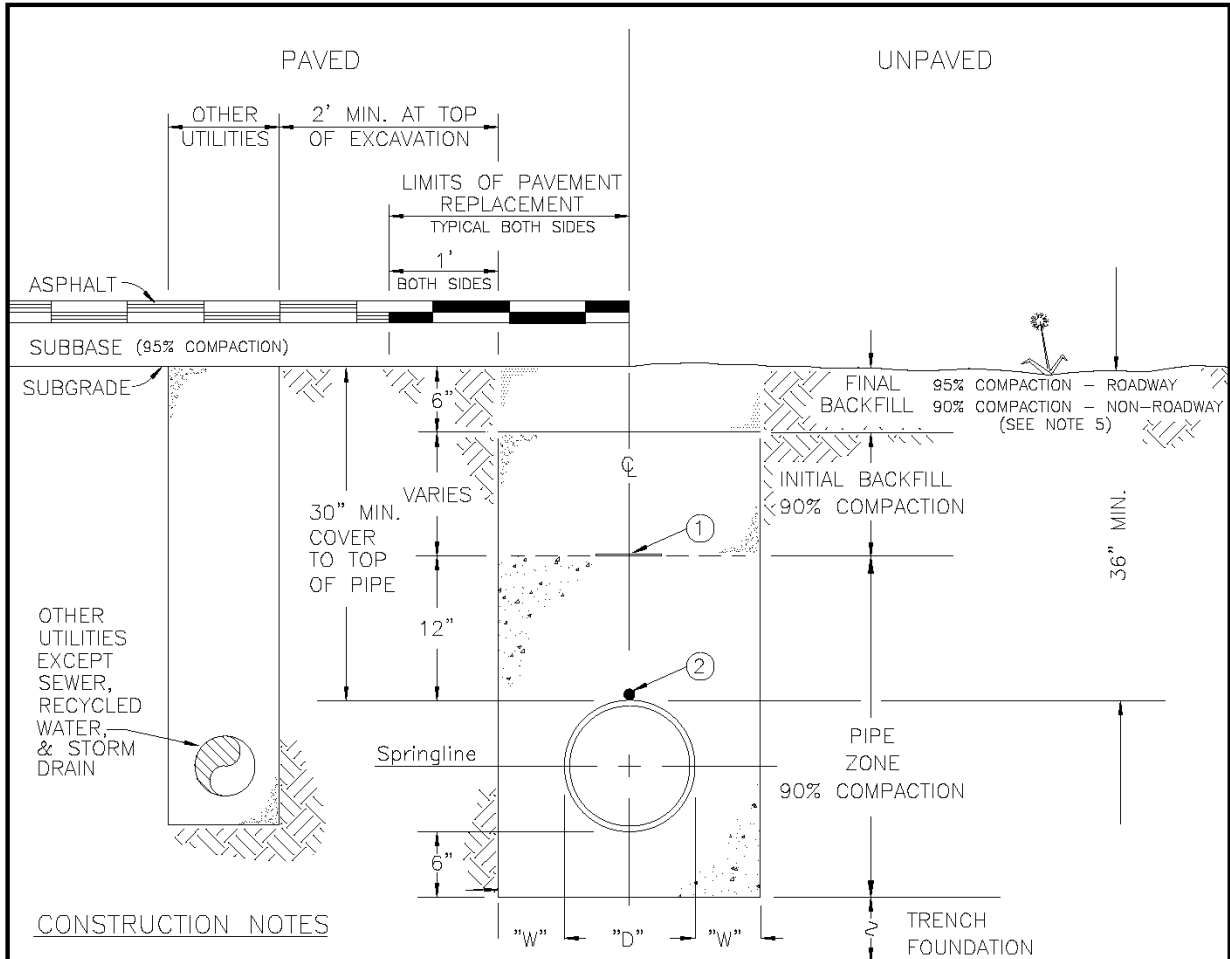


APPENDIX C

**To the Contract Documents for
Greenstone Road at Slate Creek Bridge Replacement Project
CIP No. 77137, Contract No. 3605
Federal Aid No. BRLO – 5925(103)**

EID Standards

H:\ENGINEERING EFFICIENCY EFFORT\TASK-STANDARD DETAILS\WATER\AUTOCAD SET\W10 - WATER TRENCH SECTION.DWG



CONSTRUCTION NOTES

1. PERMITS SHALL BE REQUIRED FOR ANY EXCAVATION OVER 5 FEET IN DEPTH, INTO WHICH A PERSON IS REQUIRED TO DESCEND OR ANY EXCAVATION LESS THAN 5 FEET IN DEPTH IN SOILS WHERE HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED AND INTO WHICH A PERSON IS REQUIRED TO DESCEND.
2. PIPE TO BE LAID WITH LABEL UP ON EACH JOINT.
3. ROAD REPAIR SHALL CONFORM TO JURISDICTIONAL AGENCY PERMIT CONDITIONS AND SPECIFICATIONS.
4. COMPACTION IS RELATIVE TO ASTM 1557.
5. ENCROACHMENT PERMIT CONDITIONS TAKE PRECEDENCE WHEN MORE RESTRICTIVE.
6. SEWER UTILITIES ARE NOT PERMITTED WITHIN 10' HORIZONTALLY AND/OR 1' VERTICALLY OF WATER FACILITIES.
7. RECYCLED WATER AND STORM DRAIN UTILITIES ARE NOT PERMITTED WITHIN 4' HORIZONTALLY AND/OR 1' VERTICALLY OF WATER FACILITIES.
8. PIPE SIZES BELOW 6" REQUIRE A MINIMUM TRENCH CLEARANCE OF 6" ON EACH SIDE OF PIPE.
9. INSTALL #10 TRACER WIRE ON ALL APPURTENANCES. INSTALL A PULL BOX AT EVERY 1000 FEET INTERVAL OF TRACING WIRE ALONG THE PIPE MAIN.

| TRENCH WIDTH TABLE | | |
|--------------------|--------------------|-----|
| PIPE SIZE | TOTAL TRENCH WIDTH | |
| | MIN | MAX |
| 6" | 18" | 24" |
| 8" | 20" | 26" |
| 12" | 24" | 30" |
| 16" | 40" | 52" |
| 20" | 44" | 56" |
| 24" | 48" | 60" |
| 30" | 54" | 66" |
| 36" | 60" | 72" |
| 42" | 66" | 78" |
| 48" | 72" | 84" |

| ITEM # | DESCRIPTION |
|--------|----------------------------------------------------------|
| ① | 12" WIDE BLUE NON-METALLIC WARNING TAPE MARKED WATERLINE |
| ② | TRACING WIRE #10 A.W.G. DIR. BUR. |

EL DORADO IRRIGATION DISTRICT

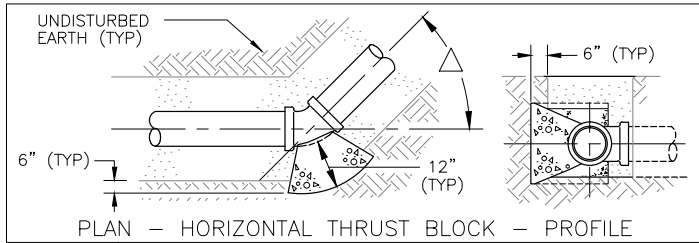
WATER TRENCH SECTION

| | | | | | |
|-------------------------|----------------|----------|------|----|-------------------------------------------|
| DRAWN BY M. SIZELOVE | SCALE NONE | REVISION | DATE | BY | EID STANDARD DRAWING NO. W10 |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |
| | | | | | |

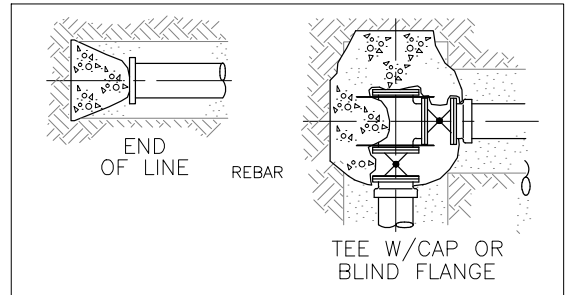
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NOTES

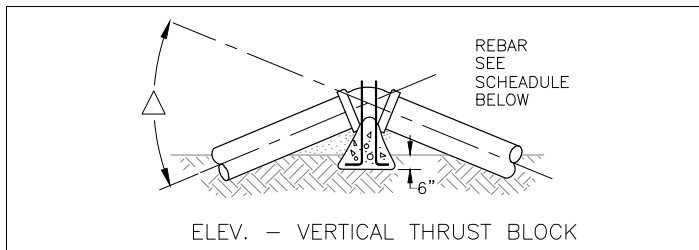
1. THRUST BLOCK DESIGN IS BASED ON TEST PRESSURE=200psi, SOIL BEARING PRESSURE=1500lbs/SF. INSTALLATIONS USING HIGHER PRESSURE OR LOWER SOIL BEARING PRESSURE SHALL BE ADJUSTED ACCORDINGLY, AND SUBMITTED FOR APPROVAL BY EID ENGINEERING DEPARTMENT.
2. THRUST BLOCKS SHALL BE CONSTRUCTED OF CALTRANS CLASS "B" CONCRETE.
3. THRUST BLOCKS SHALL BE PLACED AGAINST UNDISTURBED SOIL.
4. JOINTS, NUTS AND BOLTS SHALL BE KEPT CLEAR OF CONCRETE AND BE ABLE TO BE OPERATED WITHOUT DISTURBING THRUST BLOCK(S).
5. REBAR SHALL BE SHAPED WITH 90° BEND AT END, AND MINIMUM OF 3" CLEARANCE FROM SOIL.
6. COAT EXPOSED REBAR WITH 80 MILS OF COLD-APPLIED BITUMASTIC WATER PROOFING COMPOUND. WRAP EXTERIOR OF VALVE AND ACTUATOR WITH 8 MIL POLYETHYLENE SHEETING AND TAPE PER EID SPECIFICATION.
7. ALL REBAR SHALL BE GRADE 60 STEEL. **1**



| PIPE DIA. (in) | HORIZONTAL THRUST BLOCK BEARING AREA (S.F.) | | | |
|----------------|---------------------------------------------|----------|-------|-------|
| | D=11.25° | D=22.50° | D=45° | D=90° |
| 4 & 6 | 1.0 | 2.0 | 4.0 | 7.0 |
| 8 | 2.0 | 3.0 | 7.0 | 12.0 |
| 10 | 3.0 | 5.0 | 10.0 | 18.0 |
| 12 | 4.0 | 7.0 | 14.0 | 26.0 |



| PIPE DIA. (in) | THRUST BLOCK BEARING AREA (S.F.) |
|----------------|----------------------------------|
| 4 & 6 | 5.0 |
| 8 | 8.0 |
| 10 | 13.0 |
| 12 | 18.0 |



| PIPE DIA. (in) | VERTICAL THRUST BLOCK VOL. OF CONCRETE (C.Y.) | | | |
|----------------|-----------------------------------------------|----------|-------|-------|
| | D=11.25° | D=22.50° | D=45° | D=90° |
| 4 & 6 | 0.4 | 0.7 | 1.4 | 2.6 |
| 8 | 0.6 | 1.2 | 2.4 | 4.5 |
| 10 | 0.9 | 1.8 | 3.6 | 6.8 |
| 12 | 1.3 | 2.6 | 5.1 | 9.5 |

| REBAR SIZES (VERTICAL THRUST ONLY) | | |
|------------------------------------|-------------|-------|
| PIPE SIZE | D | REBAR |
| 4-10 | 0° to 90° | #5 |
| 12 | 0° to 22.5° | #5 |
| 12 | 45° | #7 |
| 12 | 90° | #8 |

| REBAR SIZES (HORIZONTAL THRUST ONLY) | |
|--------------------------------------|-------|
| PIPE SIZE | REBAR |
| UP TO 10" | #4 |
| 12" | #5 |

M:_STANDARD DESIGN DETAILS CAD\90_SHEET_SETS\W11 THRUST BLOCK DETAILS.DWG 20151029.094900

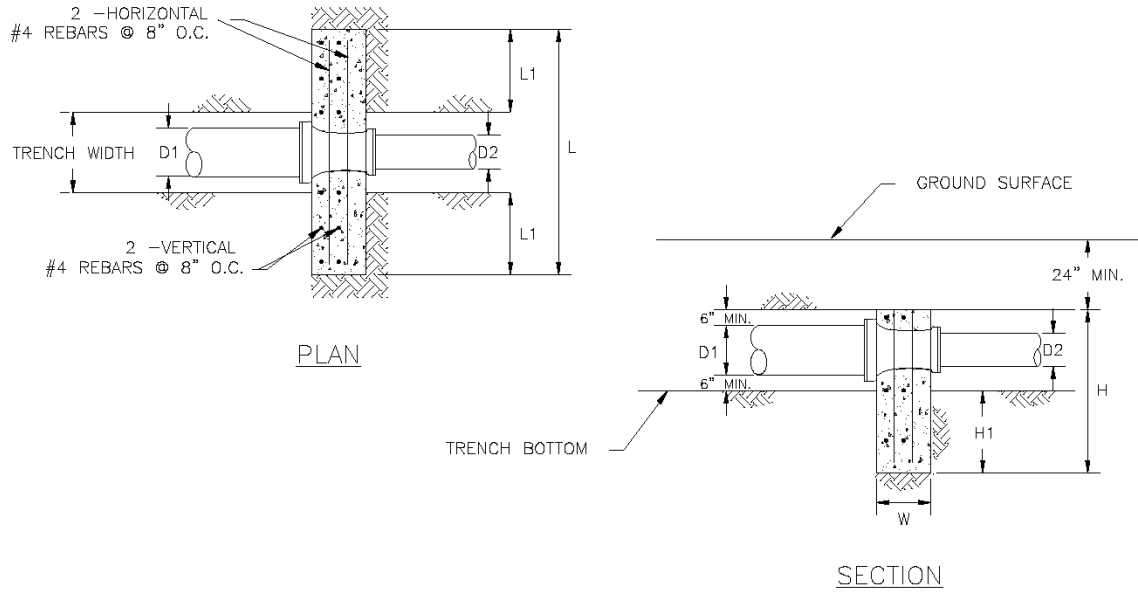
EL DORADO IRRIGATION DISTRICT

THRUST BLOCK DETAILS

| | | | | | |
|-------------------------|----------------|---------------|------------------|----------|---------------------------------|
| DRAWN BY M. SIZELOVE | SCALE NONE | REVISION 1 | DATE 10/29/15 | BY TS | EID STANDARD DRAWING NO. W11 |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |

H:\ENGINEERING EFFORT\TASK-STANDARD DETAILS\WATER\AUTOCAD SET\W11A - THRUST BLOCK DETAILS.DWG

20100127.103139

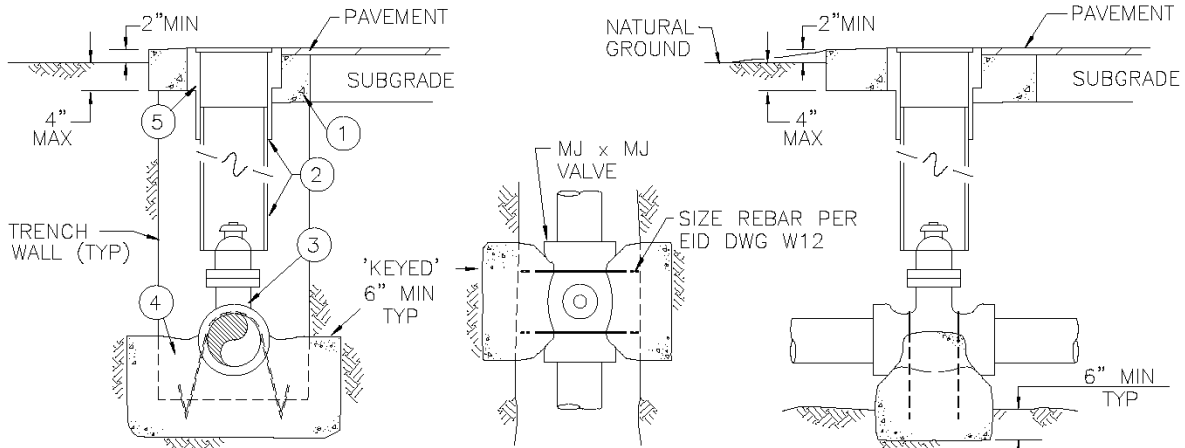


| D1xD2 (IN) | REDUCER | | | | | | | |
|---------------|--------------------------|-----------|-----------|------------|------------|--------------------------------------------------|-------------------------------------------|-----------------|
| | TRENCH WIDTH* (IN) | L (IN) | H (IN) | H1 (IN) | L1 (IN) | TOTAL AREA INCL. TRENCH (IN ²) | MIN. BEARING AREA** (IN ²) | THRUST (LBS) |
| 18X12 | 36 | 86 | 57 | 25 | 25 | 4902 | 3750 | 31819 |
| 18X10 | 36 | 94 | 62 | 30 | 29 | 5828 | 4614 | 39597 |
| 18X8 | 36 | 100 | 66 | 34 | 32 | 6600 | 5382 | 45960 |
| 16X12 | 36 | 72 | 48 | 18 | 18 | 3456 | 2376 | 19798 |
| 16X10 | 36 | 82 | 54 | 24 | 23 | 4428 | 3294 | 27576 |
| 16X8 | 36 | 88 | 58 | 28 | 26 | 5104 | 3966 | 33940 |
| 12X10 | 30 | 52 | 34 | 8 | 11 | 1768 | 954 | 7778 |
| 12X8 | 30 | 62 | 41 | 15 | 16 | 2542 | 1762 | 14142 |
| 12X6 | 30 | 68 | 45 | 19 | 19 | 3060 | 2280 | 19091 |
| 12X4 | 30 | 72 | 48 | 22 | 21 | 3456 | 2676 | 22627 |
| 10X8 | 30 | 48 | 32 | 8 | 9 | 1536 | 816 | 6364 |
| 10X6 | 30 | 56 | 37 | 13 | 13 | 2072 | 1352 | 11313 |
| 10X4 | 30 | 62 | 41 | 17 | 16 | 2542 | 1822 | 14849 |
| 8X6 | 24 | 42 | 28 | 6 | 9 | 1176 | 648 | 4950 |
| 8X4 | 24 | 48 | 32 | 10 | 12 | 1536 | 1008 | 8485 |
| 6X4 | 24 | 38 | 25 | 5 | 7 | 950 | 470 | 3535 |

* IF A DIFFERENT TRENCH WIDTH IS USED, THE THRUST BLOCK SHALL MAINTAIN THE MINIMUM BEARING AREA SHOWN.
 ** BEARING AREA REQUIRED ON UNDISTURBED SOIL OUTSIDE OF TRENCH.

| | | | | | |
|-------------------------------|----------------|----------|------|----|--------------------------------------------|
| EL DORADO IRRIGATION DISTRICT | | | | | |
| THRUST BLOCK DETAILS | | | | | |
| DRAWN BY M. SIZELOVE | SCALE NONE | REVISION | DATE | BY | EID STANDARD DRAWING NO. W11A |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |

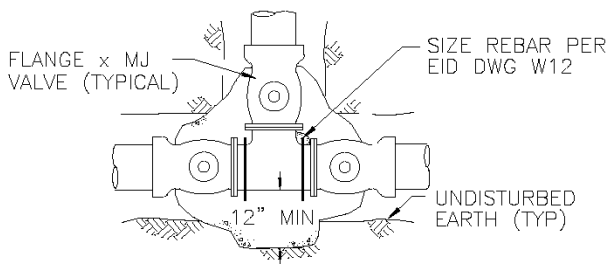
H:\ENGINEERING EFFICIENCY EFFORT\TASK-STANDARD DETAILS\WATER\AUTOCAD SET\W12 - GATE VALVE INSTALLATION.DWG 20100127.092242



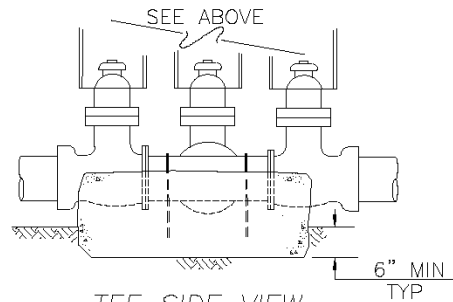
IN-LINE END VIEW

IN-LINE INSTALLATION

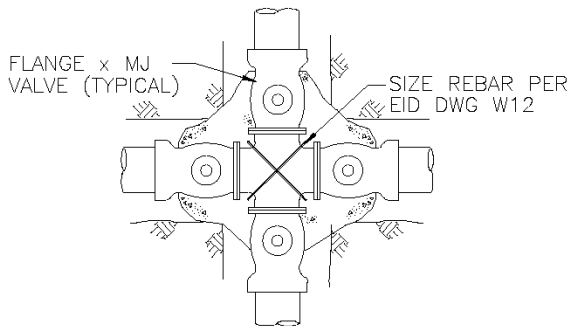
IN-LINE SIDE VIEW



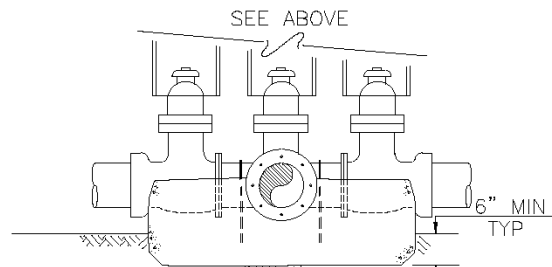
TEE INSTALLATION



TEE SIDE VIEW



CROSS INSTALLATION



CROSS SIDE VIEW

CONSTRUCTION NOTES

1. CENTER AND PLUMB RISER OVER VALVE NUT.
2. SHAFT EXTENSION REQUIRED WHERE TOP OF NUT IS MORE THAN 3' BELOW FINISH GROUND. SHAFT SHALL BE 1-1/4" DIA. WITH A SELF-CENTERING DEVICE. SEE EID DWG W14.

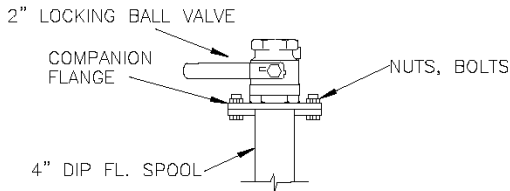
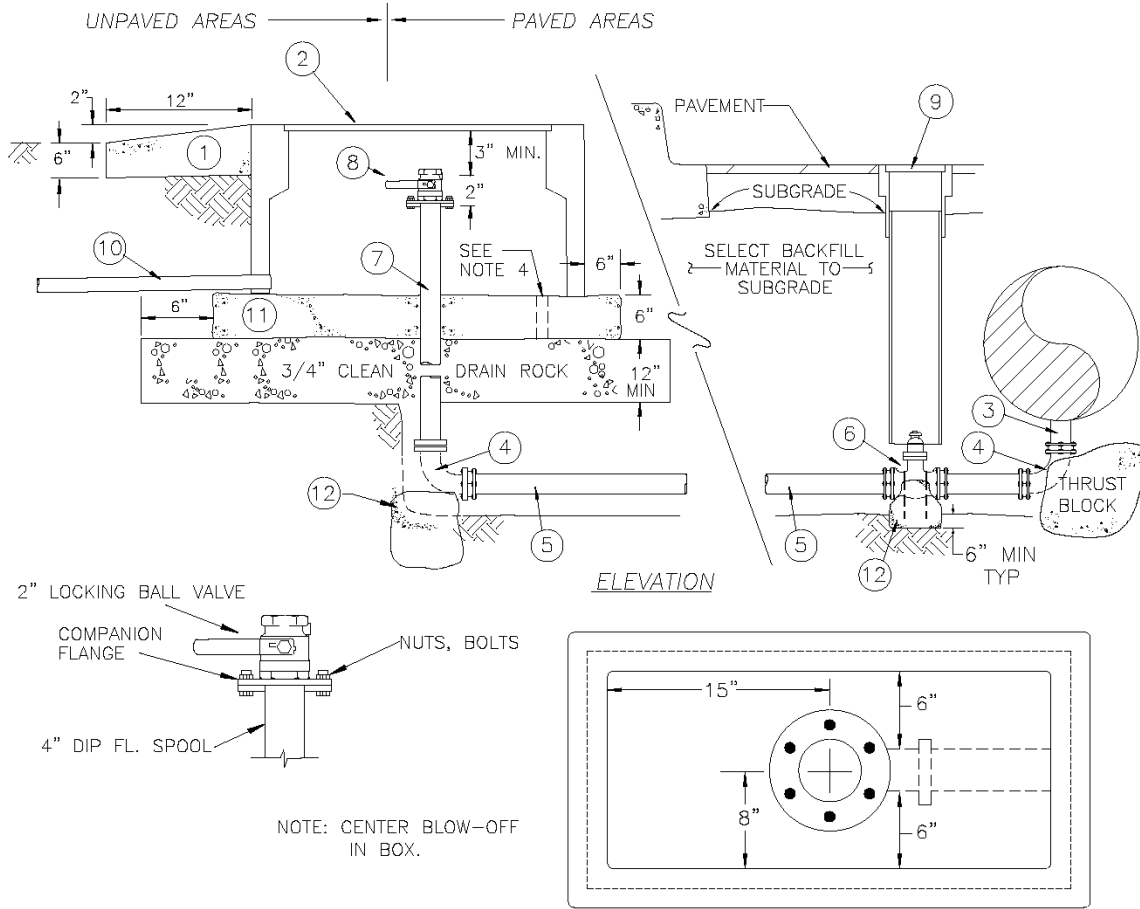
| ITEM # | DESCRIPTION |
|--------|-------------------------------------|
| ① | 6"x6" CONCRETE COLLAR |
| ② | 8" PVC-C900 PIPE RISER ONE PIECE |
| ③ | GATE VALVE |
| ④ | THRUST BLOCK, SEE EID DWG W12 |
| ⑤ | G5 CONCRETE VALVE BOX WITH IRON LID |

EL DORADO IRRIGATION DISTRICT

GATE VALVE INSTALLATION

| | | | | | |
|------------------------|----------------|----------|------|----|------------------------------------|
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION | DATE | BY | EID STANDARD DRAWING NO. W12 |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |

H:\ENGINEERING EFFICIENCY TASK-STANDARD DETAILS\WATER\AUTOCAD SET\W15B - 4 INCH IN LINE BLOW OFF.DWG
20100127.092508



NOTE: CENTER BLOW-OFF IN BOX.

PLAN

CONSTRUCTION NOTES

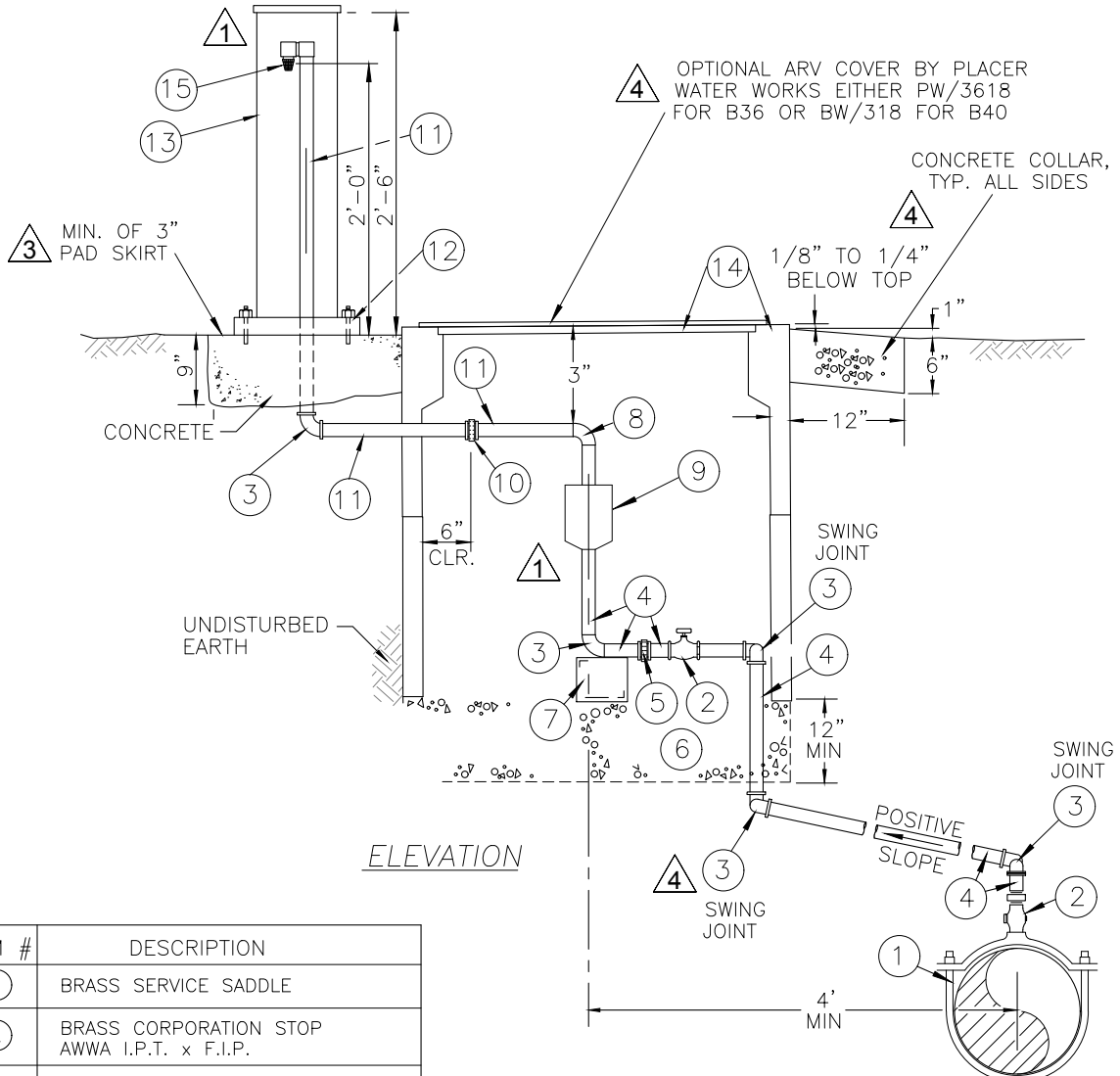
1. 4" BLOW-OFF TO BE INSTALLED ON 10" MAINS AND LARGER.
2. LOCATION OF BLOW-OFF BOX TO BE SHOWN ON PLANS AND FIELD VERIFIED.
3. BLOW-OFFS LARGER THAN 4" SHALL HAVE PRIOR EID APPROVAL.
4. 2" DRAIN AND ROCK TO BE INSTALLED ONLY WHEN PVC DRAIN CANNOT BE INSTALLED. PRIOR EID APPROVAL REQUIRED.
5. BOXES FOR BLOW-OFF ASSEMBLY SHALL BE INSTALLED BEHIND CURB OR BACK OF WALK. BOXES CANNOT BE INSTALLED IN ROADWAY.

| ITEM # | DESCRIPTION |
|--------|-------------------------------------------------------------|
| ① | 6"x6" CONC. COLLAR (PAVED) 6"x12" CONC. COLLAR (UNPAVED) |
| ② | PRECAST CONCRETE UTILITY BOX WITH STEEL COVER |
| ③ | M.J. x FL. TEE |
| ④ | 4" 90° BEND FL x MJ |
| ⑤ | 4" PIPE, D.I. |
| ⑥ | 4" M.J. GATE VALVE |
| ⑦ | 4" D.I.P. FL. SPOOL |
| ⑧ | COMPANION FLANGE, NUTS, BOLTS & 2" LOCKING BALL VALVE |
| ⑨ | VALVE BOX PER EID DWG W13 |
| ⑩ | 2" PVC DRAIN LINE. INSTALL WHERE SHOWN. |
| ⑪ | CONCRETE SLAB |
| ⑫ | THRUST BLOCK PER EID DWG W12 |

EL DORADO IRRIGATION DISTRICT

4" IN-LINE BLOW-OFF ASSEMBLY

| | | | | | |
|------------------------|----------------|----------|------|----|-------------------------------------|
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION | DATE | BY | EID STANDARD DRAWING NO. W15B |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |



| ITEM # | DESCRIPTION |
|--------|--------------------------------------------------------------|
| ① | BRASS SERVICE SADDLE |
| ② | BRASS CORPORATION STOP AWWA I.P.T. x F.I.P. |
| ③ | FITTINGS SAME AS PIPE MATERIAL |
| ④ | SCH. 40 BRASS, DOUBLE WRAPPED WITH PVC TAPE |
| ⑤ | BRASS UNION |
| ⑥ | 3/4" CLEAN DRAIN ROCK |
| ⑦ | SUPPORT BLOCK, BRICK |
| ⑧ | STREET ELBOW |
| ⑨ | COMBINATION AIR VALVE UNLESS OTHERWISE SPECIFIED ON PLANS |
| ⑩ | UNION PVC |
| ⑪ | PVC SCH. 80 |
| ⑫ | ENCLOSURE ANCHORED IN CONC. W/4 HOLLOW BOLTS |
| ⑬ | PLACER WATER WORKS MODEL PW/AV32M ENCLOSURE - BLUE |
| ⑭ | CONCRETE BOX W/ STEEL LID, SEE NOTE 6 |
| ⑮ | VENT W/ 20-MESH S.S. SCREEN |

CONSTRUCTION NOTES

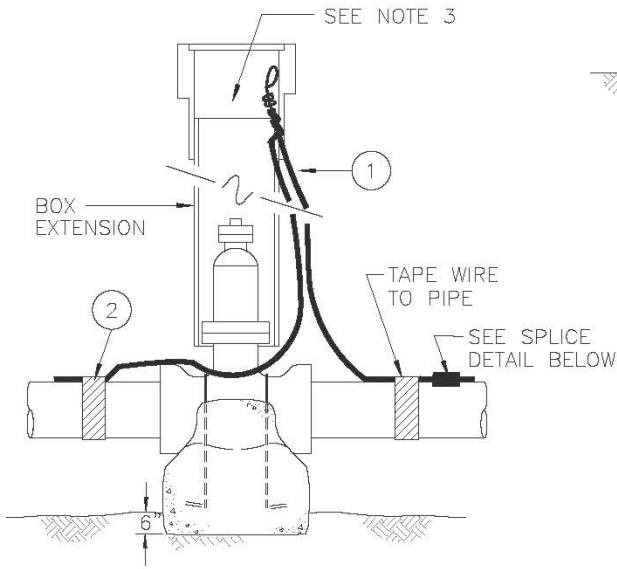
1. SIZE OF PIPING SHALL MATCH SIZE OF AIR VALVE.
2. ENGINEER TO SPECIFY TYPE & SIZE OF VALVE.
3. AIR VALVES LARGER THAN 2" SHALL BE BY SPECIAL DESIGN.
4. AIR VALVE SHALL BE PLACED OUTSIDE OF TRAFFIC AREAS.
5. CENTER VALVE IN LONGITUDINAL DIRECTION IN BOX.
6. CHRISTY B36 FOR 1" ARV, B40 FOR 2" ARV.
7. SERVICE SADDLE SHALL NOT BE INSTALLED WITHIN 36" OF VALVE, JOINT OR FITTING. 2

EL DORADO IRRIGATION DISTRICT

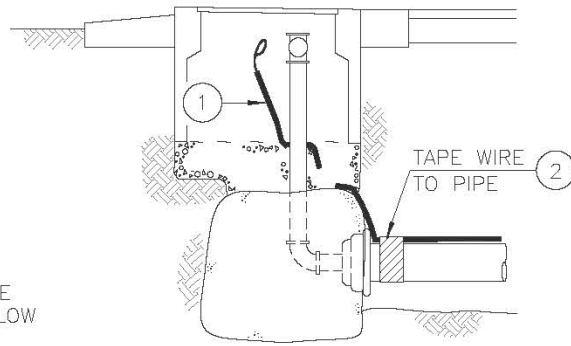
1" & 2" AIR VALVE ASSEMBLY

| | | | | | |
|------------------------|----------------|---------------|------------------|----------|------------------------------------|
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION 2 | DATE 04/03/14 | BY TS | EID STANDARD DRAWING NO. W16 |
| APPROVED B. MUELLER | DATE 4 / 09 | 3 | 10/29/15 | TS | |
| | | 4 | 11/14/17 | PW | |
| | | | | | |

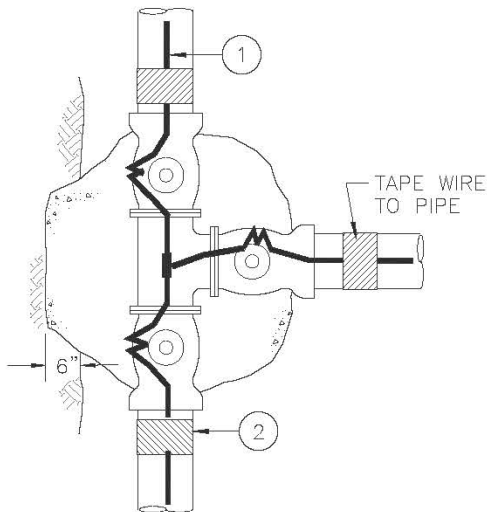
M:_STANDARD DESIGN DETAILS\CAD\90_SHEET_SETS\W19 LOCATING WIRE INSTALLATION.DWG
 20140403.093400



VALVE BOX ELEVATION



END-OF-LINE BLOW-OFF ELEVATION

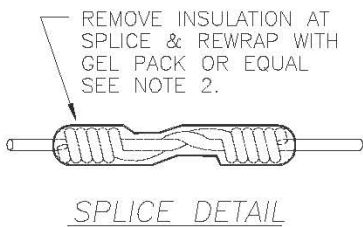


TEE W/3 GATE VALVES - PLAN

| ITEM # | DESCRIPTION |
|--------|-----------------------------------------------------------------------------------------------------------|
| 1 | #10 SOLID A.W.G. COPPER TRACER WIRE (DIR. BUR.) WITH THERMO-PLASTIC INSULATION. PLACE ON OUTSIDE OF RISER |
| 2 | WRAP TAPE |

CONSTRUCTION NOTES

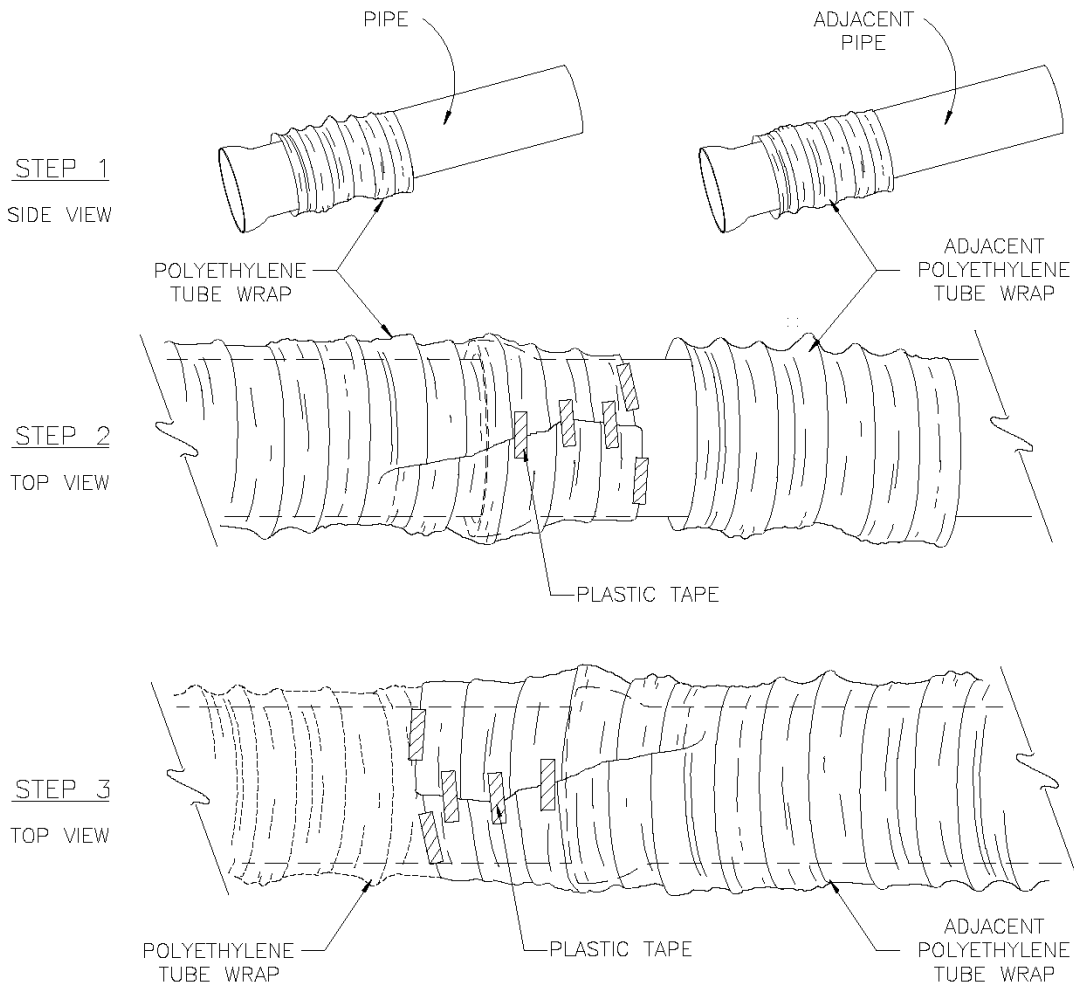
1. LOCATING WIRE SHALL BE INSTALLED WITH ALL PIPE. WIRE TO BE TAPED TO BASE OF CURB STOP.
2. LOCATE WIRE DIRECTLY ON TOP OF THE PIPE AND TAPE TO PIPE. (FOUR PLACES EVERY FULL PIPE SECTION.) WESTERN UNION SPLICE WITH GEL PACK, ¹ SOLDER OR OTHER EID APPROVED METHOD, NO ACID.
3. STRIP APPROXIMATELY 3 INCHES OF INSULATION AT THE TERMINATION OF THE WIRE IN THE VALVE OR METER BOX.
4. LEAVE 2 FEET OF TRACING WIRE AT TERMINATING ENDS.
5. INSTALL AN EXTRA VALVE BOX IF NECESSARY WHERE LOCATION WIRE IS TERMINATED AND SHOW ON THE PLANS.
6. THE CONTRACTOR SHALL TEST THE CONTINUITY OF THE FINISHED INSTALLATION.



| | | | | | |
|-------------------------------|----------------|---------------|------------------|----------|---------------------------------|
| EL DORADO IRRIGATION DISTRICT | | | | | |
| LOCATING WIRE INSTALLATION | | | | | |
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION 1 | DATE 04/03/14 | BY TS | EID STANDARD DRAWING NO. W19 |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |

H:\ENGINEERING EFFICIENCY EFFORT\TASK-STANDARD DETAILS\WATER\AUTOCAD SET\W25 - POLYETHYLENE WRAP.DWG

20100127.100027



FIELD INSTALLATION – POLYETHYLENE WRAP (10 MIL. MIN.)

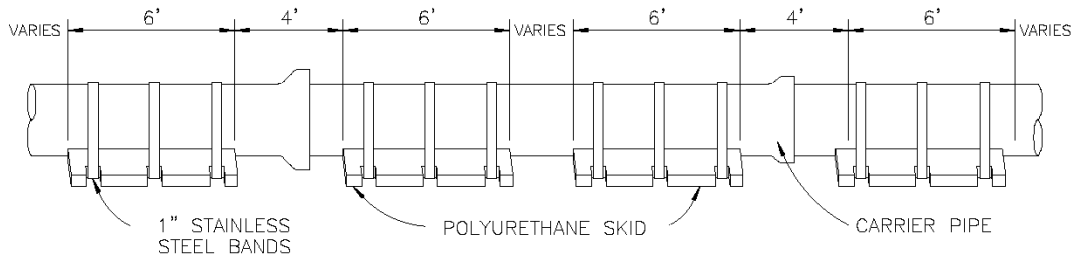
- STEP 1 – PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING INTO TRENCH.
- STEP 2 – PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.
- STEP 3 – OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

CONSTRUCTION NOTES

- 1. ALL TEARS MUST BE REPAIRED AT TIME OF INSTALLATION.

| | | | | |
|-------------------------------|----------------|----------|------|------------------------------------|
| EL DORADO IRRIGATION DISTRICT | | | | |
| POLYETHYLENE WRAP | | | | |
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION | DATE | BY |
| APPROVED B. MUELLER | DATE 4 / 09 | | | |
| | | | | EID STANDARD DRAWING NO. W25 |

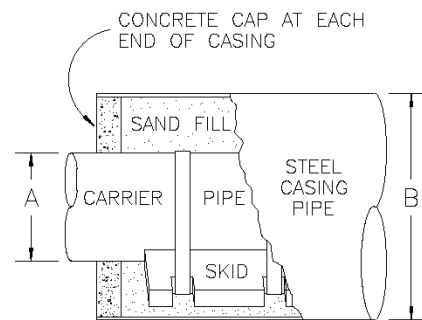
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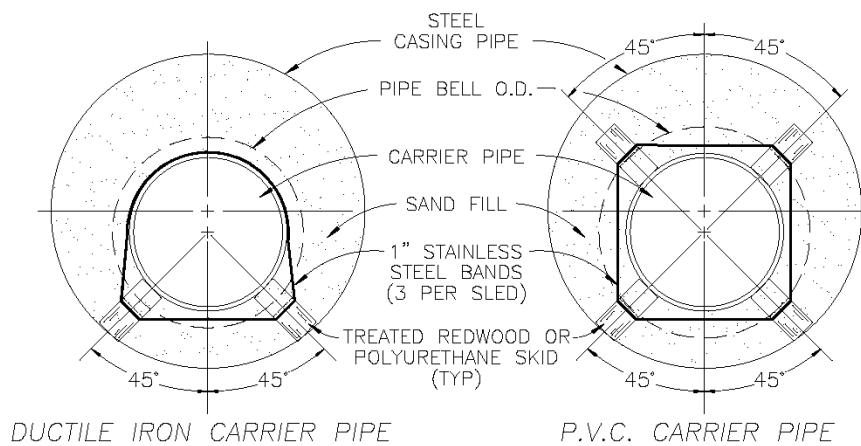
SKID & CARRIER PIPE DETAIL

NOTE: D.I. PIPE USED TO ILLUSTRATE SKID & CASING END DETAILS, P.V.C. PIPE USES 4 SKIDS PER 6' SECTION, AS SHOWN BELOW.

| CARRIER PIPE A DIAMETER | CASING PIPE B MIN. O.D. | MIN WALL THICK | | SKID SIZE |
|-------------------------------|-------------------------------|----------------|---------------|-----------|
| | | MAX COVER | | |
| | | 0'-100' | 100'-200' | |
| 6" | 16" | 0.250" 17 | 0.375" 55 | 2"x4" |
| 8" | 18" | 0.250" 12 | 0.375" 40 | 2"x4" |
| 12" | 22" | 0.3125" 11 | 0.3125" 11 | 2"x4" |
| 16" | 28" | 0.375" 10 | 0.375" 10 | 2"x6" |
| 18" | 30" | 0.375" 9 | 0.375" 9 | 2"x6" |



CASING END DETAIL



PIPE CASING DETAILS

CONSTRUCTION NOTES

1. CASING OVER 200' IN LENGTH BY SPECIAL DESIGN AND EID APPROVAL ONLY.
2. SHOULD PERMIT CRITERIA VARY FROM THIS DRAWING, THE MORE RESTRICTIVE OF THE TWO SHALL APPLY.

EL DORADO IRRIGATION DISTRICT

BORE CASING DETAILS

| | | | | | |
|------------------------|----------------|----------|------|----|------------------------------------|
| DRAWN BY A. URTEAGA | SCALE NONE | REVISION | DATE | BY | EID STANDARD DRAWING NO. W29 |
| APPROVED B. MUELLER | DATE 4 / 09 | | | | |

20100127.100430

El Dorado Irrigation District

Technical Specifications



Revision History

| Section Number and Name | Date |
|-----------------------------------------------------|------------|
| All Technical Specifications (Section Numbers Only) | 8/25/2017 |
| 33 13 00 DISINFECTING WATER MAINS | 8/1/2017 |
| 33 01 30.13 SEWER SYSTEM TESTING | 8/28/2017 |
| 31 23 33 TRENCH EXCAVATION, BACKFILL AND COMPACTION | 8/28/2017 |
| 33 12 13 DOMESTIC SERVICE LINES AND APPURTENANCES | 10/2/2017 |
| 40 05 81.13 FIRE HYDRANT ASSEMBLIES | 10/23/2017 |
| 40 05 78.13 AIR AND VACUUM VALVE ASSEMBLIES | 11/27/2017 |
| 32 12 16 ASPHALT PAVING NON-COUNTY ROADS | 11/27/2017 |
| 33 13 10 WATER PIPING SYSTEM TESTING - NEW | 11/29/2017 |
| 31 23 33 TRENCH EXCAVATION, BACKFILL AND COMPACTION | 2/16/2018 |
| 33 13 10 WATER PIPING SYSTEM TESTING | 3/5/2018 |
| 09 91 23.13 INTERIOR TANK COATING - NEW | 9/26/2018 |
| 33 12 13.26 IN-TRACT SERVICE LINES - NEW | 11/1/2018 |
| 31 23 33 TRENCH EXCAVATION, BACKFILL AND COMPACTION | 11/1/2018 |

EI Dorado Irrigation District Technical Specifications Index

Updated-11/01/2018

| By Index Number | | Alphabetical | |
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| 03 00 00 | CONCRETE AND REINFORCING STEEL | 40 05 78.13 | AIR AND VACUUM VALVE ASSEMBLIES |
| 03 40 00 | PRECASE CONCRETE VAULTS | 32 12 16 | ASPHALT PAVING NON-COUNTY ROADS |
| 09 90 00 | PAINTING AND COATING | 40 05 64 | BUTTERFLY VALVES |
| 09 91 23.13 | INTERIOR TANK COATING | 03 00 00 | CONCRETE AND REINFORCING STEEL |
| 31 23 16 | STRUCTURE EXCAVATION AND BACKFILL | 33 13 00 | DISINFECTING WATER MAINS |
| 31 23 33 | TRENCH EXCAVATION, BACKFILL AND COMPACTION | 33 12 13 | DOMESTIC SERVICE LINES AND APPURTENANCES |
| 31 71 19 | STEEL PIPE CASING AND BORING | 33 31 13.13 | DUCTILE IRON PIPE AND FITTINGS (GRAVITY SEWER FLOW) |
| 32 12 16 | ASPHALT PAVING NON-COUNTY ROADS | 33 11 13.13 | DUCTILE IRON PIPE AND FITTINGS (PRESSURE FLOW) |
| 33 01 30.13 | SEWER SYSTEM TESTING | 40 05 81.13 | FIRE HYDRANT ASSEMBLIES |
| 33 01 90 | ABANDONMENT OF FACILITIES | 40 05 61 | GATE VALVES |
| 33 11 13.13 | DUCTILE IRON PIPE AND FITTINGS (PRESSURE FLOW) | 01 00 00 | GENERAL CONSTRUCTION REQUIREMENTS |
| 33 11 13.23 | POLYVINYL CHLORIDE PIPE AND FITTINGS (PRESSURE FLOW) | 09 91 23.13 | INTERIOR TANK COATING |
| 33 12 13 | DOMESTIC SERVICE LINES AND APPURTENANCES | 33 12 13.26 | IN-TRACT SERVICE LINES |
| 33 12 13.26 | IN-TRACT SERVICE LINES | 33 39 13 | MANHOLES |
| 33 13 00 | DISINFECTING WATER MAINS | 09 90 00 | PAINTING AND COATING |
| 33 13 10 | WATER PIPING SYSTEM TESTING | 33 31 13.23 | POLYVINYL CHLORIDE PIPE AND FITTINGS (GRAVITY SEWER FLOW) |
| 33 31 13.13 | DUCTILE IRON PIPE AND FITTINGS (GRAVITY SEWER FLOW) | 33 11 13.23 | POLYVINYL CHLORIDE PIPE AND FITTINGS (PRESSURE FLOW) |
| 33 31 13.23 | POLYVINYL CHLORIDE PIPE AND FITTINGS (GRAVITY SEWER FLOW) | 03 40 00 | PRECASE CONCRETE VAULTS |
| 33 39 13 | MANHOLES | 33 84 00 | RECYCLED WATER SYSTEM |
| 33 84 00 | RECYCLED WATER SYSTEM | 33 01 30.13 | SEWER SYSTEM TESTING |
| 40 05 61 | GATE VALVES | 31 71 19 | STEEL PIPE CASING AND BORING |
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GENERAL CONSTRUCTION REQUIREMENTS
(Developer Projects)

1.0 GENERAL

1.1 Scope - This section describes general conditions and requirements for construction of the water and sewer systems. The developer/engineer shall prepare such general and special supplemental conditions as are necessary to define the project specifics, nature and location of the work, contractual arrangements, payment for work and any other matters concerning the owner and his contractor. The District's Technical Specifications shall also be incorporated into and made a part of the contract for the construction of all projects.

2.0 PRECONSTRUCTION

2.1 Preconstruction Meeting - Following final approval of plans, signed agreements, payment of fees, and issuance of all permits, a preconstruction meeting shall be scheduled by the developer/engineer. No construction shall begin until a preconstruction meeting has been held with the District's Inspection Division. Five business days notice shall be given to schedule a preconstruction meeting.

2.2 A minimum of four copies of shop drawings and/or descriptive literature for materials proposed for use but not included in the District's "Manufacturer's List" shall be submitted to the District and receive favorable review prior to being used in the work. Prior to submittal to the District, each submittal shall be favorably reviewed by the contractor and engineer. To assure that each submittal has been first reviewed by the contractor and engineer, each submittal shall contain the date of review and the name of the reviewer for the contractor and engineer, along with a statement that the submittal has been reviewed and that it meets the specified requirements for the project. A stamp may be used for this purpose as long as the date and the signature are original for each submitted item. After review, two copies will be returned to the contractor.

Each submittal package shall include a Submittal Transmittal form containing the following information:

- A. Project Name and District Project Number.
- B. Contractor's name.
- C. The submittal item number, beginning with 001.
- D. Date of the submittal.

- E. The requested date of return of the submittal (not less than two weeks, and three weeks for electrical submittals).
- F. The specification section and paragraph number.
- G. Any deviation from project requirements or District standards.
- H. In the lower right hand corner, a 3" x 4" block shall be set aside for District use. This area shall remain free of text or drawing information. Each sheet of shop drawing or sketch submitted shall have the same size area and location dedicated for District use.

When the contractor elects to incorporate material included on the District's "Materials List" a complete product submittal will not be required, but the contractor shall submit a Certificate of Compliance from their supplier, certifying that the supplied item is on the District's Material List.

District review of any submittal shall not relieve the contractor of responsibility to comply with all requirements of the approved plans and District standards. District review shall be only for conformance with the design concept of the project and for compliance with the information given in the approved plans and shall not extend to means, methods, sequences, techniques or procedures of construction, safety precautions or programs incident thereto. The review of a component as such will not indicate acceptance of the assembly in which the item functions. The contractor will be responsible for coordination of assemblies consisting of separate components.

- 2.3 Substitutions - Articles or materials not specified by the District's Manufacturers List must be submitted to the District for consideration per Section 2.2.
- 2.4 Quality of Material - Materials and equipment to be incorporated into the project shall be new. In case a reference is not clear as to which of several available grades is desired, the highest quality material shall be used.
- 2.5 Permits - All permits shall be submitted to the District at the preconstruction meeting. The following shall be required of the contractor:
 - A. Encroachment - Where construction will encroach into the public right-of-way, the Contractor shall obtain all necessary encroachment permits from the County Department of Transportation and/or from Caltrans.
 - B. Explosives - Where the contractor anticipates the use of explosives in conjunction with construction, a blasting permit shall be first obtained from the appropriate agency, and all nearby property owners shall be notified (see Section 31 23 33).

3.0 CONSTRUCTION

3.1 Protection/Operation of Existing Facilities - A primary concern of the District, is the protection and operation of the District's facilities. No developer or contractor will be allowed to operate any existing valves or to cause a shutdown of any portion of the system without prior approval from the District's Operations and Maintenance (O&M) Department. Operation of valves during a shutdown will be done by O&M Department personnel. Any planned shutdown shall be discussed at the preconstruction meeting or at least three working days in advance of the work. Shutdowns will only be allowed if no other reasonable alternative exists, such as the use of a "hot-tap" connection. When shutdowns are required, the District will make an evaluation of whether the shutdown should be done during the day or during the night or on weekends. Contractor/developer economics will be weighed less heavily in the decision than in the interruption and inconvenience to existing customers. Any shutdown will require an approval of a notification plan for existing customers by the District.

3.2 Compaction Tests - The District will require certified compaction tests from the engineer/developer to confirm compliance with compaction specifications. Compaction shall be tested at locations selected by the Inspector.

The contractor shall make all necessary excavations for compaction tests as directed by the District.

3.3 Utilities and Existing Facilities - The contractor shall contact all owners of underground facilities known to be in the area of construction and request marking of these facilities through Underground Services Alert (USA). USA's phone number is (800) 642-2444.

The fact that any underground utility and/or facility is not shown on the plans shall not relieve the contractor's responsibility to comply with these standards. It shall be the contractor's responsibility to ascertain prior to commencing work, the existence of any underground utilities, which may be subject to damage by reason of his operations.

The District will locate its facilities upon satisfactory advanced notification.

3.4 Shipment and Delivery - All pipe shall be braced and studded to prevent damage during shipment. Any damaged pipe or fittings delivered and unloaded at trench side shall be removed by the contractor from the work site upon notification by the District Inspector.

Loading and unloading of pipe, as well as placement in the trench, shall be done with straps at each end. Chains, cables or other similar devices

that may damage the pipe, shall not be allowed to come into contact with the pipe.

- 3.5 Quality of Workmanship - All work shall be performed by persons experienced in the specific work, under competent supervision and in a manner satisfactory to the District.
- 3.6 Exposing Existing Facilities - When connections are to be made to any existing pipe or appurtenance where the actual size, elevation, or position of the facility is unknown, the contractor shall excavate and expose the existing facility prior to submitting the "Request for Tie-In" (Form E-9).
- 3.7 Connections to Existing Facilities - The contractor shall initiate a request for a connection to existing facilities on the form provided by the District. The contractor shall submit a form a minimum of three business days before the requested connection. Connections shall be scheduled only on Tuesdays through Thursdays. Connection requests that interrupt service to more than 10 customers shall be submitted not less than 5 business days before the connection date. Connections will not be approved for days before or after a holiday.

The operation of any existing District valve or other facility shall be by District personnel only.

The contractor shall be fully prepared to complete the connection in the time allotted and shall not stop work until the facilities are restored to service or until directed to do so by the District. All possible preparatory work shall be completed to the satisfaction of the District prior to a connection.

- 3.8 Hot Taps - The contractor shall notify the District Inspector of the scheduled time for all hot taps. Taps shall be made in accordance with the plans. All welds on steel mains shall be made by certified pipe welders.

The contractor shall initiate a request for a hot tap of existing facilities on the form provided by the District. The contractor shall submit the form a minimum of 3 business days before the requested hot tap. The contractor shall submit information on the tapping sleeve prior to submitting the request for a hot tap.

- 3.9 Abandonment - Abandonment of existing water lines, sewer lines, and/or structures shall be as shown on the plans. Pipelines cut shall be sealed with an appropriate plug.

- 3.10 Inspection Field Acceptance and Guarantee Period - The Engineering Department is responsible for inspection of all excavation and pipe laying

including appurtenant structures and trench backfill from trench foundation to subgrade. All such work shall be available for inspection at all times. Construction shall begin within five days after the preconstruction meeting. 48 hours notice shall be given prior to the start of any construction and 24 hours notice for specific inspection requests. Failure to provide proper notification may delay the starting date of inspection since the Engineering Department may not be able to inspect the work and cannot accept any work for which inspection has not been arranged. The primary responsibility for compliance with all District requirements and standards rests with the developer and/or contractor. Any acceptance of a portion of the work by a District Inspector does not relieve the developer/contractor of this basic responsibility.

Field acceptance is made by the District Inspector and will not coincide with the date of final acceptance of the work. The one-year warranty period for all work shall begin on the date of field acceptance. Any defective work discovered during this period shall be repaired or replaced and a new one-year period shall begin for that corrected work.

All overtime, holiday or weekend inspection will be subject to District approval.

Field acceptance will be withheld until work not accepted by the District is reconstructed and complies with District Standards.

- 3.11 Public Relations - The contractor shall conduct its affairs in a manner, which will minimize disturbance to residents in the vicinity of the work. The job site shall be maintained in a condition, which shall bring no discredit to the District or its personnel, and all affected improvements shall be restored to at least their original condition.
- 3.12 Defective Work - Any defective materials or workmanship, which shall become evident within one year after field acceptance; shall be replaced or repaired without cost to the District. Refusal of the contractor to correct defective work which is clearly his responsibility may be just cause to bring legal action to correct the deficiencies as well as to withhold exoneration of performance and payment bonds.
- 3.13 High Water Table - Where the water table is, or anticipated to be, within the trench excavation, pipe zone material shall be reviewed and have prior approval from the District. The District may require a sand/cement slurry or a fabric envelope of crushed rock.
- 3.14 Protection of Existing Utilities - The contractor shall be responsible for the care and protection of all existing sewer pipe, water pipe, gas mains,

culverts, or other facilities and structures that may be encountered in or near the area of the work.

In the event of damage to any existing facilities during the progress of the work and of the failure of the contractor to exercise the proper precautions, the contractor will pay for the cost of all repairs and protection to said facilities. The contractor's work may be stopped until repair operations are complete.

3.15 Recycled Water for Construction grading etc.

The following are the procedures and guidelines for the use of recycled water for construction grading, dust control, compaction and temporary reservoirs.

- A. All construction connections shall be tagged with warning tags, as follows: Warning- Reclaimed Water, Do Not Drink.

Use tags as manufactured by T. Christy Enterprises or approved equal. Tags shall be affixed to stationary tanks, water trucks, and all service points or any other inlet or outlet using recycled water.

- B. Water trucks, water tanks, or any other receptacle, including but not limited to pipe or hose used for storage or conveyance of recycled water must be approved through EID and the El Dorado County Department of Environmental Health.

- C. No fittings hose, or pipe, or any other appurtenance used for recycled water shall connect to a potable domestic water source.

- D. All PVC pipe extending from the point of connection to EID's system shall be marked: "Caution Recycled Water." The PVC piping shall conform to all material specifications as set forth by EID.

- E. Any water truck, water tank, or other storage receptacle to be converted from recycled water use to potable domestic water use shall be thoroughly cleaned and disinfected to the satisfaction of the El Dorado County Department of Environmental Health and EID.

Contact EID's Customer Services Department prior to connection to the District's system at (530) 622-4513, to arrange for inspection to ensure compliance with District Standards.

Failure to comply with any of the above requirements places the construction site in violation of District Rules and Regulations, and will result in termination of service until appropriate corrective steps have been taken.

END OF SECTION

CONCRETE AND REINFORCING STEEL

1.0 GENERAL

1.1 Scope - This specification includes concrete materials, mixing, placement, formwork, reinforcement and curing.

1.2 Submittals - Prior to placement, the following shall be submitted:

- A. Supplier's concrete mix data sheet showing contents and proportions of cement, aggregate, water, and any admixtures.
- B. Reinforcing steel schedule, if requested.

2.0 MATERIALS

2.1 Concrete - Portland cement concrete shall be composed of portland cement, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete".

Concrete for each portion of the work shall be of the class as shown below, for the type of work performed.

| <u>Caltrans Class</u> | <u>Type of Work</u> | <u>Max. Slump (inches)</u> |
|-----------------------|---------------------------------------------------------------------------------------|----------------------------|
| A | All reinforced structures, manhole bases, piers, vaults | 4 |
| B | Anchors, thrust blocks, encasements, cradles, and miscellaneous unreinforced concrete | 4 |
| | Maximum water/cement ration to be 0.55 | |

Rapid setting concrete may be used. Accelerating admixtures may be added to the concrete mix as approved by the District.

2.2 Grout - Grout shall be composed of 1 part Type II Portland Cement to 1 ½ parts sand. The sand shall be washed, well-graded sand such that all will pass a No. 8 sieve. Water shall be clean potable water. The quantity of water to be used in the preparation of grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended. Grout shall attain a minimum compressive strength of 2,000 psi in 28 days.

Rapid setting, non-shrink, "5-minute" grout may be used or required in certain circumstances as approved by the District.

- 2.3 Reinforcing Steel - Reinforcing steel shall conform to ASTM A 615, Grade 60. Reinforcing steel shall be fabricated in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Reinforcing steel shall be delivered to the site bundled and tagged for identification.
- 2.4 Tie Wire - Tie wire shall be 16 gage minimum, black, soft annealed.
- 2.5 Bar Supports - Bar supports in beams and slabs exposed to view after form stripping shall be galvanized or plastic coated. Concrete supports shall be used for reinforcing concrete placed on grade.
- 2.6 Forms - Forms shall be accurately constructed of clean lumber and shall be braced to provide sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure and consolidation without deflection from the prescribed lines.

The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure.

3.0 EXECUTION

- 3.1 Formwork - The contractor shall notify the District a minimum of one working day before his intended placement of concrete to enable the District to check the form lines, grades, and other required items before placement of concrete.

Unless otherwise indicated on the plans, all exposed sharp concrete edges shall be $\frac{3}{4}$ -inch chamfered.

Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities where applicable.

- 3.2 Reinforcement - Reinforcing steel shall be placed in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.

All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings.

Reinforcing steel shall not be straightened or re-bent in a manner that will damage the material. The contractor shall not use bars with bends not

shown on the drawings. ALL STEEL SHALL BE COLD BENT - DO NOT USE HEAT.

All bars shall be free from rust, scale, oil, or any other coating which would reduce or destroy the bond between concrete and steel.

Reinforcement steel shall be positioned in accordance with the drawings and secured by using annealed wire ties or clips at intersections and supported by concrete or metal supports, spacers, or metal hangers. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage. Bars, additional to those shown on the drawings, which may be found necessary or desirable by the District for the purpose of securing reinforcement in position, shall be provided.

All reinforcing steel and wire mesh shall be completely encased in concrete. Reinforcement shall be placed a minimum of two-inches clear of any metal pipe or fittings. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

Reinforcing dowels shall be secured in place prior to placing concrete. The contractor shall not press dowels into the concrete after the concrete has been placed. The minimum lap for all reinforcement shall be 40 bar diameters. Additional reinforcement shall be placed around the pipe or openings as indicated in the drawings.

Wire mesh reinforcement is to be rolled flat before being placed in the form. The contractor shall support and tie wire mesh to prevent movement during concrete placement. Welded wire fabric shall be extended to within two inches of the edges of the slab. Splices shall be lapped at least 1 ½ courses of the fabric and a minimum of six inches. Laps and splices shall be securely tied at ends and at least every 24 inches with 16-gage black annealed steel wire. The contractor shall pull the fabric into position as the concrete is placed by means of hooks, and then work concrete under the steel to ensure that it is at the proper distance above the bottom of the slab.

3.3 Embedded Items - All embedded bolts, dowels, anchors and other embedded items shall be held correctly in place in the forms before concrete is placed.

3.4 Mixing and Placing Concrete - Concrete, either ready mix or batch mixed, shall be placed in the forms before taking its initial set. No concrete shall be placed in water except with approval of the District.

As the concrete is placed in the forms, or in excavations to be filled with concrete, it shall be thoroughly settled and compacted throughout the

entire layer by internal vibration and tamping bars. Concrete shall not be permitted to fall more than six feet and shall be deposited as nearly as practicable to its final position.

All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet or sandblasted to bare aggregate as directed. An approved bonding agent shall be used before the concrete is deposited.

- 3.5 Concrete Finishing - Immediately upon the removal of forms, all voids shall be neatly filled with cement mortar.

The surfaces of concrete to be permanently exposed to view shall be smooth, free from projections, and thoroughly filled with mortar.

Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screeded to a uniform surface and worked with suitable tools to a light broom finish.

- 3.6 Protection and Curing of Concrete - The contractor shall protect all concrete against damage. Exposed surfaces of new concrete shall be protected from the direct rays of the sun and from frost by being kept damp for at least two weeks after the concrete has been placed, or by using an approved curing process.

END OF SECTION

PRECAST CONCRETE VAULTS

1.0 GENERAL

- 1.1 Scope - The work covered by this section shall consist of furnishing all materials, accessories, equipment, tools, transportation, service, labor and performing all operations to furnish and install the precast concrete vaults in accordance with this section of the specifications and applicable drawings. Excavation and backfill to be in accordance with Section 31 23 16.

Precast concrete vaults and covers shall be manufactured in a plant especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

- 1.2 Submittals - Prior to installation the following is to be submitted:

A. Submit manufacturer's catalog data on precast items. Show dimensions of vault, thickness of walls, and top slab. Show reinforcing. Show materials of construction by ASTM reference and grade.

- 1.3 Design Loads - Design loads shall consist of dead load, live load, impact, and, in addition, loads due to water table and any other loads which may be imposed upon the structure. Live loads shall be for HS-20 per AASHTO standard specifications for highway bridges. Design wheel load shall be 16 kips. The live load shall be that which produces the maximum shears and bending moments in the structure. Minimum wall thickness shall be six inches.

2.0 MATERIALS

- 2.1 Concrete - Portland cement concrete shall conform to Class A as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete."
- 2.2 Reinforcement - Reinforcement shall be deformed reinforcement in accordance with ASTM A615 or ASTM A497 for welded deformed wire fabric.
- 2.3 Joint Sealing Compound - Joint sealing compound shall be impermeable to water; have high bonding strength to steel, concrete, etc., maintain permanent plasticity; resistant to applicable chemical exposure; and complies with the applicable Federal Specifications.

- 2.4 Access Door - Access doors shall be Type JD-AL as manufactured by the Bilco Company, New Haven, Conn., or equal.
- 2.5 Vents - Vents shall be constructed from 6-inch C-900 PVC pipe and fittings. Fittings shall be socket-welded type.

Each vault shall have two vents, one upper and one lower.

Install 304 stainless steel insect screen over vent openings above ground.

3.0 EXECUTION

- 3.1 Installation - Openings or "knockouts" in precast concrete vaults shall be located as shown on the drawings and shall be sized sufficiently to permit passage of the largest dimension of pipe and/or flange. Upon completion of installation, all voids or openings in the vault walls around pipes shall be filled with 3,000 psi non-shrink grout.

All joints between precast concrete vault sections shall be made watertight. The joint sealing compound shall be installed according to the manufacturer's recommendations to provide a watertight joint, which remains impermeable throughout the design life of the structure.

Access doors shall be built up so that the hatch is flush with the surrounding surface unless otherwise specified on the drawings or by the District. The contractor is responsible for placing the cover at the proper elevation where paving is to be installed and shall make all necessary adjustments so that the cover meets these requirements.

The vault floor shall contain an 18-inch diameter hole for installation of a gravity drain or sump. The vault floor shall be constructed so that there is a positive slope to the sump.

- 3.2 Exterior Coating - All exterior surfaces shall be coated with a minimum 30 mil (wft) of bitumastic 30 mil.

END OF SECTION

PAINTING AND COATING

1.0 GENERAL

1.1 Scope - This section governs materials and application of painting and coating for exposed pipe and appurtenances.

1.2 Submittals - Prior to application, the following shall be submitted:

A. Paint or coating manufacturer's product data sheet showing suitability of material for intended use including instruction on surface preparation and application.

1.3 Color Schedule - Above-ground or exposed facilities shall be color coded to differentiate from potable water, reclaimed water, and wastewater facilities as follows:

Potable Water: Medium Blue

Reclaimed Water: OSHA Safety Purple

Wastewater: OSHA Safety Green

2.0 MATERIALS

2.1 Alkyd Primer - All primer shall be lead free and rust-inhibitive synthetic-alkyd based. It shall be designed for use with an alkyd enamel finish coat.

2.2 Alkyd Enamel - Enamel shall be a high gloss industrial type, lead free, synthetic alkyd based, intended for use on exterior metal surfaces.

2.3 Bituminous Mastic - Bituminous mastic shall be coal-tar pitch based and shall have a minimum of 68% solids by volume.

2.4 Epoxy Paint - Epoxy shall be a colored polyamide cured epoxy with not less than 49% solids by volume.

All coatings and pigments to be used on potable water services shall have FDA approval for use with potable water.

3.0 EXECUTION

3.1 General - The requirements for painting and coating ferrous surfaces shall generally conform to the SSPC (Steel Structures Painting Council) and to

the manufacturer's recommendations. Application of the paint or coating system shall not be permitted if, in the opinion of the District, the equipment, climate, or safety conditions do not meet the above recommendations.

The contractor shall stir, strain, and keep coating materials at a uniform consistency during application. Each coating shall be applied evenly, free of brush marks, sags, runs and other evidence of poor workmanship. Finished surfaces shall be free from defects and blemishes.

The contractor shall not use thinners unless permitted by the District. If thinning is allowed, the maximum allowable amount of thinner per gallon of coating material as recommended by the manufacturer shall be used. Coating materials shall be stirred at all times when adding thinner and the coating material surface shall not be flooded with thinner prior to mixing. The contractor shall not reduce coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry film thickness.

Deliver all paints to the job site in the original, unopened containers.

3.2 Surfaces not to be Coated - The following surfaces shall not be painted and shall be protected during the painting of adjacent areas:

- A. Mortar-coated pipe and fittings
- B. Concrete surfaces (i.e. vaults)
- C. Stainless steel
- D. Anodized aluminum
- E. Nameplates
- F. Manhole frames and covers
- G. Grease fittings
- H. Glass
- I. Brass, copper or bronze
- J. Platform gratings
- K. Buried pipe, unless specifically required in the piping specifications

3.3 Surface Preparation - The contractor shall not prepare more surface area than can be coated in one day. Pipe that has already been factory primed or painted shall not be sandblasted. All surfaces shall be prepared in accordance with the manufacturer's recommendations.

Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words are used in these specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council).

3.4 Shop Applied Primer - Surfaces that are shop primed shall receive a field touch up of primer to cover all scratches or abraded areas.

3.5 Alkyd Enamel - All above-ground or exposed piping, fire hydrants, and exposed metalwork shall be painted using an alkyd system.

A. Surface Preparation:

1. All rust, mill scale, or weld splatter shall be removed by sandblasting or power tool cleaning.
2. All unpainted surfaces shall be solvent cleaned.
3. All abraded or scratched enamel coatings shall be sanded smooth or receive power tool cleaning.
4. All failures in the existing coating shall be sandblasted.
5. All existing surfaces to be repainted shall be washed with TSP and stiff bristle brush.

B. Primer - All unpainted or damaged surfaces shall be coated with primer to a dry-film thickness or not less than 2 mils.

C. Finish Coat - The finish coats shall be two or more coats of alkyd enamel applied to a dry-film thickness of 3 mils, providing a total painted dry film thickness of not less than 5 mils.

3.6 Bituminous Mastic - Buried metal (flanges, non-stainless steel nuts and bolts, flexible couplings, exposed reinforcing steel, etc.) shall be coated with a minimum of 20 mils of bituminous mastic.

All surfaces coated with bituminous mastic shall be covered with 8 mil polyethylene wrap.

3.7 Epoxy Coating - Only those metal surfaces specifically called out, shall be epoxy coated and applied as follows:

A. Surfaces to be epoxy coated shall be sandblasted.

B. Sandblasted surfaces shall be coated with primer to a dry film thickness of 3 mils.

C. Two coats of epoxy paint shall be applied (4 mils each) to the primed surface. The manufacturer's recommended drying time between coats shall be followed.

D. The contractor shall prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Partial batches and multiple component

coatings that have been mixed beyond their pot life shall not be used. Touch up paint shall be provided. The contractor shall mix only the components specified and furnished by the paint manufacturer. The contractor shall not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.8 Application Limitation - Paint or coating shall not be applied under the following conditions:

- A. When the surrounding air temperature or the temperature of the surface to be coated is below 40 degrees Fahrenheit or as recommended by the manufacturer of the specified coating system.
- B. When the temperature of the surface to be coated is more than 5 degrees Fahrenheit below the air temperature or when the surface temperature is over 120 degrees Fahrenheit .
- C. When the surface to be coated is wet, moist, or contaminated with any foreign matter.
- D. During rain, fog, or mist, or when the relative humidity exceeds 80%.
- E. When the temperature is less than 5 degrees Fahrenheit above the dewpoint.

If above conditions are prevalent, the application of coating shall be delayed or postponed until conditions are favorable. Dew or moisture condensation should be anticipated and if such conditions are prevalent, coating work shall be delayed until mid-morning to be certain that the surfaces are dry. The day's coating shall be completed in time to permit the film sufficient drying time prior to damage by climatic conditions.

If a change in climatic conditions damages a coating application, the contractor shall repair the damaged coating to its specified condition as directed by the District.

Paint shall be applied in such a manner as to assure an even, smooth, uniform adhering coat free from dirt, runs, brush marks and laps, and shall be applied as recommended by the manufacturer. Paint shall not be applied when freshly painted surfaces can become damaged by rain, fog, or condensation or when inclement weather can be anticipated. Fresh paint damaged by the elements shall be replaced by the contractor at his expense. Drop cloths shall be used to protect floors, equipment, piping and other exposed surfaces from spattering and spillage. Paint shall be

allowed to dry thoroughly between applications of successive coats. The manufacturer's recommended time between coats will be used as a guide by the District as to when the next coat of paint may be applied. The District must give approval before successive coats are applied.

The contractor shall notify the District after surface preparation and after the application of each coat of paint.

4.0 TESTING

- 4.1 General - The District will perform such tests as are required to ensure compliance with all phases of the work including surface preparation, abrasive blast cleaning, and the application of the coating systems.

If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and topcoated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

END OF SECTION

INTERIOR TANK COATING

1.0 GENERAL

- 1.1 Scope - The Contractor shall provide all labor, materials, equipment and incidentals required to coat with Endura-Flex 1988 a NSF/UL 61 100% solids polyurethane certified lining system. The interior fugitive dust will also be fully contained utilizing SSPC/Guide 16 (Baghouse).

The Contractor shall have a current California C-33 license, SSPC certified, and must be licensed and approved by Endura-Flex for the system specified herein. The Contractor shall submit five projects within the last two years using plural component equipment and NSF-61 100% solids polyurethane on the interior of potable water storage tanks. The information shall include Name of project, size of project, name and phone number of owner and Engineer.

When the new interior coating has completely cured, the Contractor shall clean and disinfect the tank.

After filling the tank, the District shall test the tank water for bacteriologic and volatile organic contamination, and for aesthetic quality. The District shall not accept the project until the tank water meets the California Water Quality Control Board and federal drinking water standards. In addition, the tank will not be accepted until the coating system is free of taste and odor associated with the coating product and does not impart any adverse aesthetic quality to District water.

The Contractor should expect to blast down to bare steel and providing "Near White Metal Blast Cleaning" (SSPC/SP # 10 with a 3-4 mil angular profile) to allow for proper adhesion.

The Contractor shall dispose 100% of all wastes from abrasive blasting and any other wastes or debris generated during work. The Contractor shall sample and test wastes as required by applicable regulatory agencies, and as necessary for classification of wastes prior to disposal. The Contractor shall bear all costs for waste sampling, testing, accumulation, transport, and disposal, including the cost for wastes classified as hazardous and non-hazardous.

The District shall conduct a one-year warranty inspection and the Contractor shall provide floor protection, lighting, and scaffolding during the inspection. The Contractor shall be present at the inspection and disinfect the tank after any necessary repairs are complete.

At least two days prior to start of work, the Contractor shall arrange with the District for a pre-construction conference at the job site to ensure that all parties are familiar with the entire project, including specifications and the manufacturer's printed application instructions.

1.2 Submittals

- A. The Contractor shall provide a separate submittal for each material to be used in the work. At a minimum provide submittals for Abrasive materials, Paint systems, and any other additives. Thinners are not allowed to be added to the coating system, but they may be used for cleanup with District approval only.
- B. The Contractor shall include the following data in the submittal:
 - 1. Weight in pounds/gallon – ASTM D-2196
 - 2. % solids by volume – ASTM D-2369
 - 3. Percent solids by weight – ASTM D-2369
 - 4. Air cure dry time to re-coat – ASTM D-1640
 - 5. Minimum adhesion to steel substrate – ASTM D-4541 using a type II instrument (Minimum acceptable adhesion shall be 800 psi).
 - 6. Adhesion between coats – ASTM D-4541
 - 7. Manufacturer's batch numbers and dates of manufacture for materials to be furnished as part of this project.
 - 8. Letter from dehumidification manufacture that the equipment has been properly sized as per the specification requirements.
- C. The Contractor shall include technical data documenting that the material to be provided complies with these specifications. Submittals will not be accepted until all requirements of this specification have been confirmed.
- D. The Contractor shall include the following data in the manufacturer's recommended handling and installation instructions for the proposed paint system submittal:

1. Storage – including maximum and minimum storage temperatures
 2. Surface preparation
 3. Coating repair
 4. Application equipment
 5. Mixing and application of coating system – including a table of minimum and maximum time to re-coat as a function of temperature
 6. Curing – including curing time required before holiday testing, and curing time required before immersion as function of temperature and coating thickness. Minimum and maximum re-coat times.
 7. Ventilation and Containment System
 8. Acceptable temperatures at the time of application
- E. The Contractor shall include the following data in the equipment submittal:
1. Details of vacuum system for removing dust and abrasive from abrasive blast cleaned surfaces.
 2. The manufacturer's latest written operation instructions including recommendations for air filter maintenance and change interval for air compressors used for work.
- F. The Contractor shall include the following data in the report submittal:
1. Actual weight of blast cleaning abrasive used for field abrasive blast cleaning, submitted within 24 hours after blasting is completed.
 2. Quantity of coating material used for each coat, submitted within 24 hours after completion of each coat.
 3. Name of laboratories proposed to be used to test wastes and tank water prior to testing any materials.

4. Laboratory test results for representative waste samples prior to removing any waste materials from the job site. At a minimum, the samples shall be tested for total concentrations of the 17 metals identified in Title 22, for comparison to Total Threshold Limit Concentrations (TTLC) values. The California Waste Extraction Test (WET) shall be performed for each analyte of each sample for which the total concentration exceeds 10 times the STLC value, if any, as specified in Title 22. Toxic Characteristic Leaching Procedure (TCLP) testing shall be performed for each analyte of each sample for which the total concentration exceeds 20 times the TCLP values, if any, specified in the Federal Resource Conservation and Recovery Act. Reactivity, corrosivity, and Ignitability testing shall be performed as required by Title 22 and/or the District or representative of the disposal facility.
 5. Receipts from disposal site for all wastes. Receipts shall identify disposed material and source, show quantity of disposed material in tons or cubic yards, and show method used for final disposition as buried, incinerated, and chemically treated and/or other means.
- G. The Contractor shall include the following data in the disposal plan submittal:
1. Certification that the materials disposal plan complies with all applicable requirements of: The Federal Resource Conservation and Recovery Act; Title 22 and Title 26 of the California Administrative Code; and other applicable regulations of local, state and federal agencies having jurisdiction over the disposal of spent abrasive blast media, removed coating materials, and other waste, whether hazardous or non-hazardous.
 2. The name and Environmental Laboratory Accreditation Program Certificate number of laboratory that will sample and test spent abrasive blast media and removed coating materials. Include statement of the laboratory's certified testing areas and analyses that the laboratory is qualified to perform.
 3. Written permission to dispose of material from disposal site representative. Include name, address, and telephone number of disposal site and of representative.

4. The District shall provide written acceptance of the disposal plan prior to disposal of any wastes.

1.3 Governing Standards - The following standards (including the most recent update or version) shall govern the work unless specified otherwise in these specifications.

| | |
|---------------------------------------------------------|---------------------------------------------------------------|
| SSPC-Vol.1, | Steel Structures Painting Manual, Good Painting Practice. |
| SPC-Vol.2, | Steel Structures Painting Manual, Systems and Specifications. |
| SSPC-SP 1 | Solvent Cleaning |
| SSPC-SP 2 | Hand Tool Cleaning |
| SSPC-SP 3 | Power Tool Cleaning |
| SSPC-SP 5 | White Metal Blast Cleaning |
| SSPC-SP Guide 11 | Stripe Coating |
| SSPC-SP 7 | Brush-Off Blast Cleaning |
| SSPC-SP 10 | Near White Blast Cleaning |
| SSPC-SP 11 | Power Tool Cleaning to Bare Metal |
| SSPC-AB 1 | Mineral and Slag Abrasives |
| SSPC-PA 1 | Shop, Field and Maintenance Painting |
| SSPS-PA Guide 3 | Guide to Safety in Paint Application |
| SSPS-PA Guide 12 | Lighting |
| SSPC-Guide to Vis 1-89 | Visual Standard for Abrasive Blast Cleaned Steel |
| SSPC-V15 (3-93) | Visual Standard for Power & Hand-Tool Cleaned Steel |
| AWWA D102-97 | Standard for Painting Steel Water-Storage Tanks |
| AWWA C652 | Disinfection of Water Storage Facilities. |
| ISO-8502-3 | Preparation of Steel Substrates |
| All applicable State and Federal OSHA safety standards. | |

1.4 – Safety - The Contractor shall comply with all Federal, State, and Local applicable safety regulations and requirements. All scaffolding shall be equipped with interior stairways. No exterior ladders will be allowed.

2.0 MATERIALS

2.1 – Abrasives - The Contractor shall use abrasive grit for field blast cleaning conforming to the following:

- A. Produce a surface profile of 3 to 4 mils for the floor, shell, roof supports, ladder, and over flow.
- B. New, clean and free of contaminants, and containing no hazardous materials.

- C. Certified by California Air Resources Board, Executive Order G-565.
- E. Conform to all applicable requirements of the Local Air Quality District.
- F. Kleen Blast is approved. No sand abrasives are allowed.

2.2 Coating System - The Contractor shall provide the following coating system: Endura-flex EF-1988. The Contractor shall not use or allow to come in contact with any portion of the tank interior, any coating system or additives which have not been approved and listed by the National Sanitation Foundation, Standard 61 (NSF 61) for use in potable water tanks. Minimum adhesion value (ASTM D-4541) for the lining system using a type two instrument shall be 800 PSI. The Contractor shall provide coating "certified non-lead" (less than 0.06 percent lead by weight in the dried film) as defined in Part 1303 of the Consumer Products Safety Act.

3.0 EXECUTION

3.1 – Delivery, Storage, and Hauling

- A. The Contractor shall deliver materials as follows:
 - 1. Delivery of abrasive grit shall be in original labeled moisture-proof bags or airtight bulk containers. Abrasives shall not be reused.
 - 2. Delivery of coating system materials shall be in original, unopened containers with seals unbroken and labels intact. Labels shall identify type of material, color, and batch number. No material shall exceed six months from the original batch manufacturing date.
- B. The Contractor shall store materials as follows:
 - 1. Store materials in a single, approved location.
 - 2. Store coating system materials in enclosed, secure, and ventilated structures, and maintain temperature inside the structure within the temperature range recommended by the manufacturer.
 - 3. Keep storage location clean, neat, and free of fire hazards.

4. All operating equipment shall be placed into secondary containment to prevent accidental spills.

C. The Contractor shall handle materials as follows:

1. Avoid spilling thinners, solvents, paint products or other materials that contain toxic substances. All compressors and operating equipment shall be placed in secondary containment. All sewer or site drains shall be covered.

D. Remove discarded thinners, solvents, and paint products from the job-site daily.

3.2 – Limiting Environmental Conditions - The Contractor shall apply coatings only when conditions are within the limits prescribed by the manufacturer and shall not apply coatings when the following conditions exist:

A. Metal temperature is less than 40 degrees F.

B. Relative humidity is greater than 60 percent.

C. Contractor shall not abrasive blast or apply coatings when air temperature is less than 5 degrees F above dew point.

3.3 – Dehumidification

A. The Contractor shall provide dehumidification as required to establish and maintain the specified temperature and relative humidity inside the tank. The Contractor shall complete any blasting, coating and testing operations within the duration of time as specified. The District shall not provide a time extension for weather delay. The Contractor shall bear all cost and liability for work resulting from dehumidification equipment failure, breakdown, power failure, or down time. The Contractor is responsible for operating within County, local and home owner's association sound ordinances.

B. The Contractor shall provide dehumidification continuously from start of near white metal abrasive blasting, until a minimum of one (1) day after application of final coat and all repairs are completed, or for a longer period as recommended by the coating system's manufacturer. The Contractor shall submit a letter from the dehumidification manufacture that the equipment has been properly sized for this project prior to any abrasive blasting operations. A minimum of one air change per hour is required.

- C. The Contractor shall provide dehumidification equipment consisting of a solid desiccant (not liquid, granular, or loose lithium chloride) design having a single rotary desiccant bed capable of continuous operation, fully automatic with drip-proof electrical controller. Air heaters alone are not acceptable as dehumidification units.
- D. The Contractor shall ensure that relative humidity of processed air from dehumidification unit not exceed forty-five percent.
- E. The Contractor shall ensure dehumidification equipment provides a minimum of two complete air changes inside the tank every sixty minutes.
- F. The Contractor shall ensure areas adjacent to the surface that is to be blasted and coated are not exposed to a relative humidity greater than forty-five percent at any time during blasting, cleaning, coating, or curing.
- G. The Contractor shall ensure dehumidification equipment is placed as close to tank manhole as possible.
- H. The Contractor shall ensure cleaning of dehumidification filters prior to start of dehumidification and weekly cleaning thereafter.
- I. The Contractor shall ensure dehumidification tubing is maintained as follows:
 - J. Mechanically connected and sealed with duct tape at joints.
 - K. Extended to the center of the tank and attached to a diffuser that will distribute air equally throughout tank.
 - L. Have no dust or other foreign matter inside tubing.
- M. The Contractor shall provide and maintain 24-hour strip chart recorder for humidity and temperature and place humidity and temperature measuring devices inside tank at the start of abrasive blasting operations.

3.4 – Preparation

- A. The Contractor shall prepare surfaces to be coated in accordance with the coating manufacturer's instructions but not less than specified herein.

- B. The Contractor shall clean surfaces including: removal of all visible oil, grease, dirt, welding residue, and other contaminants from areas to be coated; inspection using a black light to locate oil and grease; and removal of slag and weld metal accumulation and splatters by chipping or grinding as required in NACE SPO-178.
- C. The Contractor shall provide blast cleaning including: removal of existing coating, under film corrosion, corrosion, and other corrosion products from all areas to be coated; and, preparation of all surfaces to be coated by abrasive blast cleaning to SSPC-SP 10 near white metal with a surface profile of 3 to 4 mils for the 100% solids polyurethane.
- D. The Contractor shall ensure complete abrasive blast cleaning of metal prior to application of coating system.
- E. The Contractor shall not reuse abrasive blast media unless the media is specifically designed for reuse, if steel abrasive is used the working mixture shall be a minimum of 75% grit and 25% shot. The Contractor shall be fully aware of the different required anchor profiles that are required for different substrates.
- F. The Contractor shall ensure maintenance of abrasive blasting equipment including:
 - 1. Installation of an oil moisture separator in the airline between compressor and blast machine.
 - 2. Installation of an air cooler/dryer in the airline between the compressor and the oil and moisture separator.
 - 3. Use of venturi nozzle.
- G. The Contractor shall ensure all surfaces to be blast cleaned are electrically grounded during blast cleaning. All air and blast lines will have cable whip checks installed.
- H. The Contractor shall provide exhaust air dust collectors to prevent discharge of dust to outside air.
- I. The Contractor shall mask-off and protect all exposed machined metal surfaces, plastic, and other surfaces not to be painted or that may be damaged by abrasive blasting or tying in to coating systems.

- J. The Contractor shall remove all dust and abrasive from freshly blasted surfaces by use of a District approved vacuum system.
- K. The Contractor shall dispose of abrasive blast media and other waste materials off-site and in accordance with approved material disposal plan and discard material directly from tank to a portable container and remove container from site. The Contractor shall ensure media is not placed on ground or other intermediate location. No abrasives shall be reused at any time.

3.5 – Application

- A. The Contractor shall adhere to general application requirements as follows:
 - 1. Mix and apply all coatings in accordance with the manufacturer's recommendations and instructions, the applicable requirements of SSPC-PA 1, and as specified herein.
 - 2. Obtain Inspector's evaluation and approval of steel surface preparation immediately prior to application of first coat.
 - 3. Obtain Inspector's evaluation and approval of cleanliness of previous coat immediately prior to application of a subsequent coat.
 - 4. Contractor shall provide ratio testing at the beginning of each application.
 - 5. The floor will be abrasive blasted and coated after the shell tested, and repaired completely.
 - 6. Apply coatings by plural component spray except:
 - 7. Apply coatings at a temperature recommended by manufacturer. Prior to mixing, coating materials shall be not less than 80 degrees F. Use explosion-proof inline heaters, as necessary.
 - 8. Scaffolding or other support system shall be free of abrasive blast media, dirt, and other foreign matter prior to coating application.
 - 9. Finish coat shall be uniform in color and gloss over the entire surface. Finish coat shall be smooth to touch with no sags,

runs, dry spray, over-spray, cracks, pinholes or other surface defects and must be even in color and appearance. When coating is applied, the previously coated area will be masked off to prevent overspray onto newly painted surfaces.

10. Coating should not be applied closer than 6 inches from an unprepared surface.
- B. The Contractor shall provide color with a submittal to the District as follows:
1. Interior: White
- C. The Contractor shall provide a Dry Film Thickness (DFT) as follows:
1. Thick Film Elastomeric Polyurethane 60 mils minimum on tank shell and floor.
 2. Thick Film Expanded Elastomeric Polyurethane 100 mils on all structural steel, ladders, and tank roof. All beams shall be completely coated prior to installation.
- D. The Contractor shall provide additional coats to achieve specified minimum dry film thickness.
- E. The Contractor shall provide application equipment as follows:
1. Plural component spray with expansion system in compliance with manufacturer's requirements, having an anti-freeze device, and fluid filter.
 2. Use fluid tip size recommended by manufacturer.
 3. Use clean fluid lines not previously used to apply zinc-rich or water-based coating materials.
 4. Clean equipment using only products recommended by the coating manufacturer.
 5. Blow lines to remove all thinners prior to painting.
 6. Hardness testing is required eight hours after each application.

7. Each application a sample shall be sprayed onto plastic and marked with the date and time of application including the batch number. This sample shall retained be given to the District.
8. Ratio checks will be performed prior to each application in clean measured beakers. All plural component pump gauges shall be in working order prior to any application, if gauges are not working they shall be immediately replaced. All gauges shall be in the zero position when pump is off.

F. The Contractor shall provide coating repairs as follows:

1. Re-coating or touch-up of areas that have cured beyond the maximum time recommended by the manufacturer require the following special preparation.
 - a. Sweep blast area and 3-inches into the surrounding area. Sweep blast under low pressure to uniformly abrade surface and feather edges. Feather edges by sanding or other means acceptable to the Inspector. Alternatively, the Contractor may power tool (SP-3) or hand tool (SP-2) once abrasive blast is complete to the acceptance of the Inspector.
 - b. Remove abrasive blast residue from blasted area with special attention to marginal areas of intact coating.
 - c. All repairs will be masked off.
 - d. Clean area with a bond solvent recommend by the manufacturer.

3.6 – Manway Gasket Replacement - The Contractor shall supply new manway gaskets for tank manways.

3.7 – Disposal Of Existing Coatings And Spent Abrasive Blast Media

- A. The Contractor shall dispose of spent abrasive blast media and removed coating materials in accordance with a District approved disposal plan.
- B. The Contractor shall coordinate and pay all costs for sampling and testing of spent abrasive blast media in order to document waste class. Minimum sampling and testing requirements are listed previously in this Section.

- C. Prior to removal of hazardous wastes off-site, the Contractor shall allow adequate time for District to review laboratory test results, as well as the time required to obtain a Hazardous Waste Generator's U.S. EPA ID Number, if required the District will provide the Contractor with written notice to dispose of all or a portion of the spent abrasive blast media and/or removal coating materials as hazardous waste, if so determined by the District that such disposal is required.
- D. The Contractor shall be responsible for all costs associated with accumulating, transporting, and disposing of spent abrasive blast media and removed coating materials.

3.8 – Clean-Up - Upon completion of the work, the Contractor shall make a detailed inspection of all work. The Contractor shall be solely responsible for all paint over-spray or fugitive dust fallout claims. The Contractor shall remove all spattering, spits, and blemishes. Upon completion, of work, the Contractor shall remove all staging, tarps, scaffolding, and containers from the site, including but not limited to: paint and thinner containers and excess paint and thinner (to be disposed of in conformance to all current regulations); paint spots removed and the entire job site cleaned; all damage to surfaces resulting from the work from this section to be cleaned, repaired or refinished to the complete satisfaction of the District. All clean up shall be completed within 7 calendar days starting at the last day of holiday testing of the tank. The Contractor shall allow adequate time for District for review of laboratory test results, as well as the time required to obtain a Hazardous Waste Generator's U.S. EPA ID Number if required. The District will provide the Contractor with written notice to dispose of all or a portion of the spent abrasive blast media and/or removed coating materials, as required. The Contractor shall bear all costs associated with site cleanup.

4.0 TESTING

4.1 – Tank Disinfection

- A. Upon complete curing, the Contractor shall submit in writing to the District certification that the coating is cured and ready to be placed into service for disinfection and testing. Tank cleaning and disinfection shall not commence without written certification.
- B. After all other work has been completed, the Contractor shall ensure that the interior of the tank is thoroughly cleaned and disinfected in accordance with the most current edition of AWWA C652, Disinfection of Water Storage Facilities. The Contractor shall ensure the tank is disinfected in accordance with Chlorination

Method 2, which requires spray wash of the tank interior with a 200-mg/ml chlorine solution. The District will assist the Contractor in filling the tank and the Contractor shall allow three (3) consecutive working days for the District to fill the tank.

- C. The Contractor shall furnish all cleaning and disinfection materials and all equipment and labor necessary for the cleaning and disinfecting operations.
- D. The Contractor shall ensure that any water used in cleaning and in disinfection of the tank, is discharged in a manner acceptable to the District and the appropriate water pollution control agency. The Contractor shall ensure all water discharged is de-chlorinated.

4.2 – Soak Period And Testing For Volatile Organic Compounds

- A. The Contractor shall ensure that water in the tank is allowed to soak for five (5) days after the tank has been filled to the over-flow level and disinfected.
- B. After the five-day soak period the District will sample and submit a single sample to a certified laboratory to test the water for presence of organic chemical contaminants (e.g. TCE, PCE, etc.) possibly having leached from the new paint system. The sample is to be tested in accordance with EPA Method 524.2. The water sample will be collected by the District in the presence of the Contractor and should be a true representation of the water in the tank at the time.
- C. The Contractor shall be liable for all cost associated with re-testing the water if tank draining and refilling is necessary.
- D. The District shall evaluate and determine acceptability of the aesthetic quality of the water as a condition of final acceptance of the work. Constituent levels found from sample results which are at or below regulated maximum contaminant levels specified by state and federal standards shall not be the sole basis for tank acceptance.
- E. The District may reject all work or a portion thereof based on any adverse taste, odor or visual defect detected or other conditions affecting the aesthetic quality of the water.

5.0 INSPECTION

5.1 Quality Assurance

- A. The District has retained a coating inspection firm to oversee all quality control related to coating operations. The inspector will report directly to the District and shall act with the District's authority in all matters related to construction. The Inspector will be a N.A.C.E. Certified Coating Inspector, who will inspect any or all phases of work to be performed as outlined herein. The inspector shall be in addition to the District Inspector; authority shall be limited to coating related work only. The District Inspector shall remain the primary observer for all work on the project. The inspector shall work for and report to the District. The Contractor shall not rely upon the coating inspector for documentation of environmental conditions and assuring compliance with plans and specifications.
- B. The Contractor shall notify the District in advance (48 hours minimum) of all surface preparation or paint application in order to perform a preliminary examination and provide acceptance of the surface preparation and each coat prior to application of the next coat.
- C. The Coating Inspector shall examine all materials, tools, and equipment to be used in the blasting and coating operations and shall have the authority to direct the Contractor to remove, replace, or repair any materials, tools, or equipment found not to be in conformance with the Contract Documents including the approved shop drawings and manufacturer's recommendations. The Contractor shall be fully responsible for compliance with all safety measures, hazardous and toxic materials regulations, and site security. Observation of or failure to observe any safety efforts of the Contractor by the Inspector shall not relieve the Contractor of this responsibility nor shall any liability transfer from the Contractor to the District or the Inspector. The Contractor shall indemnify, defend, and save harmless the District and the coating Inspector from all liability associated therewith.
- D. The Contractor shall provide evidence of regular engagement in application of 100% solids coatings for at least five years on potable water storage tanks prior to commencement of this work.
- E. The Contractor shall certify in writing that foremen and workers on-site shall be experienced and knowledgeable in preparation for and application of high performance industrial coatings.

- F. The Contractor's workmanship shall conform to standards and recommendations of SSPC Vol. 1, especially Chapters 5.1 and 6.
- G. The District may use any testing method deemed necessary by the District Coating Inspector to verify quality of work. The District may, but is not required to, monitor the quality of work pursuant to this section.
- H. The Contractor shall ensure proper materials handling and use, including: all coating materials are labeled and used in accordance with SSPC-PA 1, Paragraphs 5.1.1 thru 5.1.5, except all coating system materials without a stated shelf life shall be delivered and used within six months of the date of manufacture; and certification, from any source, that the coating system materials are still suitable for use beyond the stated shelf life or beyond the six month period specified above will not be accepted. All equipment and materials shall be stored in a secured ventilated container.
- I. The Contractor shall perform the necessary quality assurance in accordance with an approved plan. The Contractor will supply all inspection equipment. The District reserves the right to use their equipment at any time.
- J. The Contractor shall comply with the following conditions in collection and analysis of wastes:
 - 1. All testing of spent abrasive blast media and removed coating materials to classify these wastes as hazardous or non-hazardous shall be performed by a laboratory that complies with and is certified under the Environmental Laboratory Accreditation Program (ELAP) of the California Department of Public Health.
 - 2. Any Laboratory performing analysis shall provide for comparison to TTLC, STLC, TCLP limits, and RCA limits, and to all other applicable regulatory limits. Laboratory shall retain samples at least ninety (90) calendar days after all analyses are complete.
 - 3. The Contractor shall ensure collection of as many representative samples as required by the representative of the disposal facility, but not less than 4 total.
 - 4. The Contractor shall ensure the following: each sample shall have an identifying sample number assigned when the sample is taken; each sample number shall be included on

the sampling chain of custody and in all reports, correspondence, and other documentation related to the sample; each sample shall have a sampling chain of custody; and, each chain of custody show the name and organization of each person having custody of the sample, and also show the sample number, job name and location, time of day and date sample was taken, material sampled, and tests to be performed.

5. The Contractor shall notify the District at least 24 hours prior to sampling collection for the purpose of District verification of samples collected.
6. Manufacturer's Representative: The Contractor shall, at no cost to the District, provide a qualified technical representative of the coating system manufacturer at the job-site as required by the District to resolve problems related to the coating system or the application of the system.

5.2 – Quality Control

- A. The Contractor shall provide adequate lighting, without shadows, during all phases of work to insure that work is performed as specified and that the entire work area is illuminated.
- B. The Contractor shall provide ground supported scaffolding and lighting (SSPC Guide12), as determined by the Inspector, to facilitate visual and instrument inspection by the Inspector of each phase of the work and of the completed work, as so placed as directed to minimize glare and shadows. Work will be rejected if proper lighting is not achieved for a proper inspection. All scaffolding shall be equipped with stairways, no exterior ladders.
- C. The Contractor shall provide personnel to move scaffolding and furnish other assistance to District Inspectors as required.
- D. The District Coating Inspector will examine surfaces after abrasive blast cleaning to verify that all deposits of contaminants have been removed as per surface clean as per ISO 8502 (Class 0). The Contractor shall blow down, and vacuum all surfaces prior to District inspection. Tank floors shall be vacuumed.
- E. The Contractor shall verify at a minimum of two times daily that air supply is free of oil and moisture contamination (ASTM D-4285). The Contractor shall use effective oil and water separators in all main compressor airlines and shall be placed as close as

practicable to the equipment. Prior to using compressed air, the Contractor shall test the quality of air downstream of the separators at suitable outlets by blowing the air on clean white blotter for 2 minutes to check for any contamination, oil, or moisture.

- F. The Contractor shall perform the following daily: measure air temperature, humidity, relative humidity, and metal surface temperature, and determine dew point and relative humidity prior to abrasive blasting or painting. The Contractor shall provide portable temperature & humidity recorders to provide continuous permanent hard copy of the tank conditions and, repeat measurements and determination of dew point as often as the District Inspector deems necessary but not less often than every four hours at the start of preparation operations and run constantly until final cure.
- G. The Contractor shall maintain a written record of measurements and dew points, and time that measurements were taken, keep such record on-site, and make records available to District Inspector on request.
- H. The Contractor shall furnish 1 roll of Testex tape 1.5 to 4.5 mils X-course prior to the start of abrasive blasting. The District Coating Inspector may evaluate surface preparation using field abrasive blasting standards, and Testex tape. Evaluation may include inspection of blasted surfaces for dust and abrasive residue, using clear adhesive coated tape. Evaluation will be made immediately prior to coating application.
- I. The Contractor shall verify cleanliness of all spray application equipment prior to, or no later than, time of mixing coating material.
- J. The Contractor shall measure wet film thickness during coating application of coating to ensure adequate coating thickness, taking at least one measurement for each 100 square feet of application area. The Contractor shall measure dry film thickness after each coat using a non-destructive magnetic dry film thickness gauges.
- K. The District Coating Inspector may, but is not required to, also measure coating thickness, at random locations, after each coat. SSPC –PA 2 (Level 0) is only to be used for the calibration of dry film thickness gauges. This is a minimum maximum dry film thickness specification. Dry film thickness readings will not be averaged. All inspection equipment shall be supplied by the Contractor. All equipment shall have current calibration certificates. The District reserves the right to use their own equipment at any time.

- L. The District Coating Inspector will evaluate cleanliness of coated surface immediately prior to application of a subsequent coat.
- M. The Contractor shall test all coated surfaces for pinholes (NACE SPO-188) and holidays after application of the final coat in accordance with the following:
- N. Perform test in presence of the District Coating Inspector.
- O. Perform test after coating has cured as recommended by the manufacturer.
- P. Use an appropriate detector, such as Elcometer #236 or as approved by the District representative.
- Q. Re-test after coating repairs.
- R. The District may hire a third party inspector to inspect Contractor's work, but the ultimate responsibility for the quality of the Contractor's work and the performance of contractual obligations remains with the Contractor.

5.3 – Coating Inspector And Authority

- A. The Contractor shall notify the Coating Inspector in advance (48 hours minimum) of all surface preparation or paint application in order to perform a preliminary examination and provide acceptance of the surface preparation and each coat prior to application of the next coat.
- B. The SSPC-Vis1 pictorial surface standards along with dry film and wet film thickness gauges will be used by the Coating Inspector to determine acceptability of the paint application. The Contractor shall provide necessary testing equipment to perform the above-mentioned tests.
- C. The Contractor shall afford the coating inspector all reasonable facilities and assistance in monitoring the coating and priming operations. The Contractor shall provide weekly copies of their daily work reports to the coating inspector. Such reports shall include, but not be limited to, the day and date of work performed, the relevant weather conditions, the type and amount of work performed, all work related to the safety of the operation, and personnel assigned to work actually performed.

- D. To facilitate adequate inspection of all surfaces, the Contractor shall provide scaffolding or rigging necessary for the Coating Inspector to perform dry film thickness readings, and visual holiday inspection as required by these specifications and reference standards. The Contractor shall provide personnel to move scaffolding or rigging at the instructions of the District.
- E. The coating inspector shall have authority to direct the Contractor to suspend operations when environmental conditions fall outside the manufacturer's recommended parameters. The Contractor shall comply with these directions and shall not proceed until the coating inspector determines environmental conditions are sufficient to proceed. Failure to suspend coating operations as directed or restarting work without the direction of the coating inspector shall be cause for rejection of work so performed.
- F. The Contractor shall immediately remove and replace all such work in accordance with these Project Special Provisions and directions of the coating inspector. No additional compensation will be allowed for work resulting from failure to comply with the coating inspector or for surfaces not otherwise conforming to the provisions of these Project Special Provisions.
- G. The Coating Inspector shall have authority to direct the Contractor to suspend operations when environmental conditions fall outside the manufacturer's recommended parameters.
- H. The Contractor shall comply with directions and shall not proceed until the Coating Inspector determines environmental conditions are sufficient to proceed. Failure to suspend coating operations as directed or restarting work without the direction of the coating inspector shall be cause for rejection of work so performed.
- I. The Contractor shall immediately remove and replace all such work in accordance with these Project Special Provisions and directions of the Coating Inspector.
- J. No additional compensation will be allowed for work resulting from failure to comply with the coating inspector or for surfaces not otherwise conforming to the provisions of these Project Special Provisions.

5.4 – Inspector Assistance - To facilitate adequate inspection of all surfaces, the Contractor shall provide scaffolding or rigging necessary for the Coating Inspector to perform dry film thickness readings, and visual holiday inspection as required by these specifications and reference standards.

The Contractor shall provide personnel to move scaffolding or rigging at the instructions of the Coating Inspector.

5.5 – Acceptability For Paint Application - The SSPC-Vis1 pictorial surface standards along with dry film and wet film thickness gauges will be used by the Coating Inspector to determine acceptability of the paint application. The Contractor shall provide necessary testing equipment to perform the above-mentioned tests.

5.6 – Reporting - The Contractor shall afford the Coating Inspector all reasonable facilities and assistance in monitoring the coating and priming operations. The Contractor shall provide weekly copies of daily work reports to the coating inspector. Such reports shall include, but not be limited to, the day and date of work performed, the type and amount of work performed, all work related to the safety of the operation, and personnel assigned to work actually performed.

5.7 – Safety

- A. The Contractor shall provide a safe work environment at all times. In the event the Coating Inspector notes any safety deficiencies, the Contractor shall immediately rectify noted deficiencies.
- B. The Contractor shall be fully responsible for compliance with all safety measures, hazardous and toxic materials regulations, and site security. Observation of or failure to observe any safety deficiencies of the Contractor by the Coating Inspector shall not relieve the Contractor of this responsibility nor shall any liability transfer from the Contractor to the District or the Coating Inspector.
- C. The Contractor shall save harmless the District and the Coating Inspector from all liability associated therewith.

5.8 – Warranty

- A. Anniversary inspection requirements and failure criteria shall be in accordance with AWWA D-102, Section 9, except as modified herein. The total warranty period shall be two years from the final acceptance date.
- B. The District will conduct a first anniversary warranty inspection approximately one year following final acceptance of the work, including inspection of the interior of the tank. The District will establish the date of the inspection and will notify the Contractor at least thirty (30) calendar days in advance of the inspection.

- C. The Contractor shall furnish ventilation, scaffolding, and lighting equipment as necessary for any warranty inspections, and shall be present for such inspections. The District will provide an inspection report to the Contractor detailing the number and types of failures observed, the percentage of surface area where failures have occurred, and the names of the persons making the inspections.
- D. The District shall consider any location where coating has delaminated, peeled, blistered, or cracked; and any location where rusting is evident as failure of the coating system. In addition, the District shall consider photographs or reports of the coating imperfections or failures as acceptable evidence of failure.
- E. The Contractor shall be liable for all remedial work including repair of all failures by removing the deteriorated coating, cleaning the surface, and recoating with the same system in accordance with this Section. The District may allow surface preparation of small failures (areas less than 1 sq/ft.) by cleaning to bare metal in accordance with appropriate SSPC-SP standards, however, the method of repair is at the sole discretion of the District.
- F. The District will prepare a schedule for remedial work completion, to be no more than thirty (30) calendar days after the submittal of the inspection report to the Contractor. Upon failure of the Contractor to commence remedial work within ten calendar days after the starting date established by the District, the District may at its option, retain another Contractor to perform the remedial work. The Contractor shall be liable for actual cost of all such remedial work plus a 20 percent District administrative cost.
- G. The Contractor shall bear the expense of all warranty inspections of the remedial work required by the District. The Contractor shall disinfect the tank after the inspection and repairs.

END OF SECTION

STRUCTURE EXCAVATION AND BACKFILL

1.0 GENERAL

- 1.1 Scope - This section shall govern the work for structure excavation and backfill. Structure excavation shall consist of the removal of material for the construction of foundations for vaults, manholes, or other structures, and other excavation designated on the Plans or in the Specifications as structure excavation. Trenching and backfill shall be in accordance with Section 31 23 33.

Structure excavation and structure backfill shall include the furnishing of all materials and equipment; the construction or installation of all facilities which may be necessary to perform the excavations and to place and compact the backfill; and the subsequent removal of such facilities, except where they are required or permitted by the Plans or Specifications to remain in place.

- 1.2 Submittals - Upon request, the following items shall be submitted and approved by the District.
- A. Test results showing gradation, durability and sand equivalent of import material.
 - B. Permit and notification form for excavations five feet or more in depth as required by Cal-OSHA, including any trench excavation or shoring plans.

2.0 MATERIALS

- 2.1 Excavation - Excavation is unclassified. The contractor shall complete all excavations regardless of the type of materials encountered. The contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.
- 2.2 Backfill - Native earth backfill and imported backfill material shall conform to the requirements of Section 31 23 33.

3.0 EXECUTION

- 3.1 Pavement - Bituminous or concrete pavements regardless of their thickness, and curbs and sidewalks shall be cut prior to excavation for the structure in accordance with the requirements of the encroachment permit or the District.

Pavement and concrete materials shall be removed from the site. These materials may be used as backfill if approved by the District.

- 3.2 Excavation - The sides of excavations for structures shall be sufficient to leave at least 1.5 feet clear as measured from the extreme outside of form work on the structure as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made at the expense of the contractor for adjustment of construction, as directed by the engineer to meet requirements incurred by the deeper excavation. No earth backfill will be permitted to correct overdepth excavation beneath structures, and overdepth excavation in such locations shall be rectified by backfilling with sand, graded gravel, or concrete as directed by the District.

- 3.3 Bracing - The contractor's design and installation of bracing and sheeting shall take the necessary precautions to be consistent with the rules, orders, and regulations of the State of California Construction Safety Orders.

Excavations shall be so braced, sheeted, and supported that they will be safe, such that the walls of the excavation will not slide or settle and all existing improvements of any kind, either on public or private property, will be fully protected from damage.

The sheeting, shoring, and bracing shall be arranged so as not to place any stress on portions of the completed work.

The contractor shall carefully remove sheeting, shoring, bracing, and timbering to prevent the caving or collapse of the excavation faces being supported.

- 3.4 Dewatering - The contractor shall provide and maintain means and devices to continuously remove and dispose of all water entering the excavation during construction of the structure and during backfill operations.

Water shall be disposed of in a manner that will prevent damage to adjacent property and pipe trenches.

The contractor shall not allow water to rise in the excavation until backfilling around and above the structure is completed.

- 3.5 Backfill - After structures and foundations are in place, backfill shall be placed to the original groundline or to the limits designated on the plans.

No material shall be deposited against cast-in-place concrete structures until the concrete has reached a compressive strength of at least 2,500 pounds per square inch.

Backfill material shall be placed in horizontal layers not exceeding 8 inches in depth.

3.6 Compaction - Compaction requirements shall be as follows:

Backfill within 5 feet of structure: 95% relative compaction.

Structural Backfill beyond 5 feet of structure: 90% relative compaction.

Gravel Base: 95% relative compaction.

Each layer of backfill material shall be moistened and thoroughly tamped, rolled, or otherwise compacted to the specified relative density.

Compaction equipment shall be carefully operated near structures to prevent their displacement or damage. Structural fill is to be placed and compacted in uniform layers around all sides of the structure.

3.7 Excess Excavated Material - The contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material.

All surplus material shall become the property of and be disposed of offsite by the contractor.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the contractor. Before the District will accept the work as being completed, the contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the District from any liability connected therewith.

3.8 Restoration of Damaged Surfaces and Property - If any existing improvements, facilities, or vegetation not designated to be removed have been damaged, removed, or disturbed by the contractor, for whatever reason, such improvements, facilities and vegetation shall be replaced or repaired at the expense of the contractor.

3.9 Final Clean-up - After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the District.

END OF SECTION

TRENCH EXCAVATION, BACKFILL AND COMPACTION

1.0 GENERAL

- 1.1 Scope - This section governs the work for trench excavation, backfill and compaction for underground pipeline work.
- 1.2 Submittals - Upon request, the following items shall be submitted and approved by the District.
 - A. Test results showing gradation, durability and sand equivalent of pipe zone material. Additionally, for recycled aggregate base Tier 1 ESL results per the California Water Board regulations.
 - B. Permit and notification form for excavations five feet or more in depth as required by Cal-OSHA, including any trench excavation or shoring plans.
- 1.3 Testing - Testing frequency and location shall be approved by the District.

2.0 MATERIALS

- 2.1 Trench Excavation - Excavation is unclassified. The contractor shall complete all excavations regardless of the type of materials encountered. The contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.
- 2.2 Pipe Zone - Material for the pipe zone shall conform to one of the following:
 - A. Aggregate Base - Shall be ¾-inch and minus aggregate base with a sand equivalent of 30 minimum and durability index of not less than 35. Recycled aggregate base must also meet the California Water Board’s Environmental Screening Levels. All material shall generally conform to the following gradation:

| <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| ¾" | 90-100 |
| #4 | 35-60 |
| #30 | 20-30 |

- B. Plug and Drain Material - When a plug and drain system has been approved by EID and the County DOT, pipe zone material shall be

Caltrans Standard permeable material designed for the specific condition.

2.3 Subsequent Backfill – 12 inches above the top of the pipe to subgrade.

Backfill where in unpaved section shall be free from organic matter, debris, and rocks larger than 6 inches in diameter or length. The District shall be the sole judge of conformance of backfill material to this specification.

| <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| 6" | 100 |
| 3" | 50 |
| #4 | 35-50 |
| #30 | 20-50 |

Backfill where in paved roadway section shall be ¾-inch and minus aggregate base or approved alternative material with a sand equivalent of 30 minimum and durability index of not less than 35. Recycled aggregate base must also meet the California Water Board's Environmental Screening Levels. All material shall generally conform to the following gradation:

| <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| ¾" | 90-100 |
| #4 | 35-60 |
| #30 | 20-30 |

2.4 Initial Material Testing – The District requires that all material shall be tested prior to use. After the material has been approved by the Engineer one truck load of material shall be delivered to the site. Under the direction of the Engineer the Contractor is required to have the onsite material tested and results provided to the District.

3.0 EXECUTION

3.1 Excavation - Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Excavation shall only proceed when the necessary materials have been delivered to the site.

The contractor shall bear all costs of disposing of roots and all other waste materials from the excavation. Material shall be disposed of in such a manner as to meet all requirements of the state, county, and local regulations regarding health, safety, and public welfare. Non-flammable material and flammable material, when burning is not permitted, shall be disposed of off the construction site in an approved location at the contractor's expense.

The contractor shall remove obstructions within the trench area or adjacent thereto, such as abandoned concrete structures, logs, and debris of all types, without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment can be made without adversely affecting the intended function of the facility.

- A. Existing Pavement Removal - Pavement to be removed shall be removed and replaced in the manner prescribed by the agency issuing the encroachment permit.

Existing pavement, curbs, gutters, sidewalks and driveways to be removed in connection with construction shall be neatly saw cut prior to removal. Saw cuts shall have a minimum depth of one inch in concrete sidewalk. Concrete sidewalks or driveways shall be removed so that a minimum 30-inch square is replaced. If the saw cut in a sidewalk or driveway would fall within 30 inches of a construction joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. If the saw cut would fall within 12 inches of a score mark, the concrete shall be removed and replaced to the score mark. Concrete shall be removed by jackhammer.

- B. Grading - The contractor shall control grading in a manner to prevent water running into excavations. Obstructions of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can be uninterrupted in existing gutters, other surface drains or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters and private drives.

- C. Line and Grade - The contractor shall excavate the trench to the lines and grades shown on the plans. Any deviations shall first be approved by the Engineer.

The trench shall be excavated to a minimum depth of 6 inches below the bottom of the pipe. The sides of the trench shall be excavated and maintained as nearly vertical as practical.

- D. Stockpiling of Backfill Materials – Stockpile of backfill materials shall be kept in a centralized location to allow for efficient transportation and management. Backfill materials shall be controlled and not spread in the roadway. In paved roadways materials shall be stockpiled so as to keep the pavement clean and clear. If backfill materials are accidentally scattered in the roadway they shall be cleaned immediately to the satisfaction of the District.
- E. Trench Support - The trench shall be adequately supported and the safety of workers provided for as required by the standard of the appropriate regulatory agency.

All shoring for open excavations shall conform to the State of California, Department of Industrial Relations and Division of Industrial Safety "Construction Safety Orders."

The contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all existing improvements of any kind will be fully protected from damage.

No shoring once installed, shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The contractor shall obtain all permits for any excavations over five feet in depth into which a person is required to descend or any excavation less than five feet in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

Excavated material shall not be placed closer than two feet from the top edge of the trench. Heavy equipment should not be used or placed near the sides of the trench unless the trench is adequately braced.

- F. Use of Explosives - Blasting for excavation will be permitted only after securing the approval of the Engineer and only when precautions are taken to eliminate danger to life or property. Explosives are to be stored in accordance with the provisions of

DIVISION XI of the Health and Safety Code of the State of California. The contractor is responsible to secure any required permits for use and storage of explosives. The contractor shall notify the proper representatives of any public service corporation, or any individual at least 24 hours in advance of any blasting which may damage his or their property, along or adjacent to the construction zone.

Blasting mats shall be used at all times where flying rock might cause damage to any person, building, power line or other installation.

All traffic shall be stopped a safe distance from the blasting operation and all persons shall be removed from the area prior to blasting.

The contractor shall designate, in writing, a single responsible individual as Powder Foreman. Carelessness or incompetency by the powder foreman shall be grounds for immediate removal from said position or responsibility and the powder foreman shall not be permitted to handle or use explosives on the remainder of the project. Priming of all explosives shall be with electric detonators of sufficient size to ensure efficient and complete detonation of the explosive charge. All charges consisting of more than one hole shall be wired either as series or series-parallel. Straight parallel hookups will not be permitted.

The contractor is responsible to provide a power source adequate for detonation of the explosive charges consistent with the accepted standard practices involving electric detonation of explosives. Excessive blasting will not be permitted and any material outside the authorized cross section which may be loosened or shattered by blasting shall be removed.

The Engineer shall have authority to require the contractor to discontinue any method of blasting which leads to overshooting, is dangerous to the public, or is destructive to property or natural features. The contractor shall notify the District a minimum of two hours in advance of any blasting operations.

- G. Preservation of Trees - Excavation within the dripline of any tree shall conform to the following and to encroachment permits. Trees shall not be removed outside of fill or excavated areas, except as authorized by the District.

Tree roots larger than two inches in diameter shall not be cut and shall be kept moist during exposure. For damaged or severed root systems, trees shall be trimmed to compensate for the decreased root system. Trimming shall be done to the satisfaction of the inspector. All roots shall be neatly cut with saw or sharp cutter.

- H. Dewatering - The contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall continue until the backfill at the pipe zone has been completed.

The contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to public health or violate the SWPPP.

The contractor shall be responsible to obtain all required Local and State Permits.

- I. Correction of Faulty Grades - Any over-excavation carried below the grade as specified or shown, shall be rectified by backfilling with approved pipe zone material and/or aggregate base, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer.
- J. Structure Protection - Temporary support, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the contractor at his expense and subject to the approval of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.
- K. Protection of Property and Surface Structures - Trees, shrubbery, fences, poles, monuments and all other property and surface

structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer.

- L. Trench Width and Grade - The width of the trench within the pipe zone shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed the amount shown in the standard details. In general, the following shall be adhered to:

| <u>Pipe Size</u> | <u>Total Trench Width</u> | |
|------------------|---------------------------|----------------|
| | <u>Minimum</u> | <u>Maximum</u> |
| 6" | 18" | 24" |
| 8" | 20" | 26" |
| 12" | 24" | 30" |
| 16" | 40" | 52" |
| 20" | 44" | 56" |
| 24" | 48" | 60" |
| 30" | 54" | 66" |
| 36" | 60" | 72" |
| 42" | 66" | 78" |
| 48" | 72" | 84" |

Trench widths in excess of those specified must have prior written approval.

- M. Maximum Length of Open Trench - Unless otherwise specified or directed by the District, the maximum length of open trench shall be 500 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. The distance is the collective length of any location including open excavation, pipe laying, appurtenant construction and backfill which has not been temporarily resurfaced. Failure by the contractor to comply with the limitations specified herein may result in an order to halt progress of the work until compliance has been achieved. The contractor shall provide proper barricades for excavated areas. All pipe installed each day shall (at a minimum) be covered by the compacted 12-inch pipe zone backfill.

- 3.2 Trench Foundation - The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with clean imported decomposed granite which shall be compacted to provide uniform support and a firm foundation.

- A. Foundations in Poor Soil - If excessively wet, soft, spongy, unstable or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed; the unsuitable material shall be removed to a depth as determined in the field by the Engineer. The contractor's attention is called to Section 3.1 G, regarding his responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water.

3.3 Backfill and Compaction - Backfill shall be completed within the shortest possible time so that the construction area or street can be opened to traffic. If for any reason construction of the pipeline or appurtenances thereto is delayed, the District may require that the trench be backfilled and such areas or streets opened to traffic.

- A. Pipe Zone-- After completion of the trench excavation and proper preparation of the foundation, six inches of bedding material shall be placed on the trench bottom for support under the pipe. Bell holes shall be dug to provide adequate clearance between the pipe bell and the bedding material. All pipe shall be installed in such a manner as to insure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade and the joint is made, the remainder of the pipe bedding shall be placed to the limits as shown on the drawings. All bedding material shall be compacted 90% as measured by Test Method California 231, prior to placement of subsequent backfill.

When bedding material is selected, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding three inches in thickness to the centerline (springline) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage, or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe.

Each lift shall be "walked in" and supplemented by slicing with a shovel to ensure that all voids around the pipe have been completely filled. Mechanical compaction such as "pogo sticks" or "wackers", as approved, shall be used for compaction of pipe zone.

- B. Initial Backfill - The remaining portion of the trench shall be backfilled, compacted and/or consolidated by approved methods to obtain a 90% compaction as measured by Test Method 231 F. Backfill shall be good sound earth, sand or gravel. Bituminous pavement, concrete, rock, or other lumpy material shall not be used in the backfill unless these materials are scattered and do not

exceed 6 inches in any dimension and are not placed within 1 ½ feet of the surface. Material of perishable, organic matter, spongy or otherwise improper nature, shall not be used.

When backfill is placed mechanically, the backfill material shall be pushed onto the slope of the backfill previously placed and allowed to slide down into the trench. The contractor shall not push backfill into the trench in such a way as to permit free fall of the material until at least 18 inches of cover is provided over the top of the pipe. Under no circumstances shall sharp, heavy pieces of materials be allowed to be dropped directly onto the pipe or the tamped material around the pipe. Backfill shall be placed in layers not exceeding eight inches and compacted by an approved method.

Heavy duty compacting equipment having an overall weight in excess of 125 pounds shall not be used until backfill has been completed to a depth of 2 compacted feet over the top of the pipe.

If hydro-hammer is used for compaction of overlying materials, at least four feet of backfill must be placed over the top of pipe prior to its use. This is required to insure that the pipe is not damaged.

- C. Final Backfill - Final backfill placed in trenches below roadways or below shoulders of roadways, shall be compacted to a density of not less than 95% or as directed by the encroachment permit. Backfill outside of roadways shall be compacted to 90%.

Backfill shall be placed in layers not exceeding eight inches, compacted and brought up to the sub grade of the roadway.

- 3.4 Excess Excavated Material - The contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material. It is the intent of these specifications that all surplus material not required for backfill or fill shall be disposed of by the contractor outside the limits of the public right-of-way and/ or easements at no liability to the District.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the contractor. Before the District will accept the work as being completed, the contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the District from any liability connected therewith.

- 3.5 Restoration of Damaged Surfaces and Property - If any pavement, trees, shrubbery, fences, poles or other property and surface structures have

been damaged, removed, or disturbed by the contractor, whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances, or the specific direction of the District, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the contractor.

- 3.6 Final Clean-Up - After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the District.

END OF SECTION

STEEL PIPE CASING AND BORING

1.0 GENERAL

- 1.1 Scope - This specification governs the furnishing and installing of carrier pipe and casing to a true line and grade as shown on the plans to be bored and jacked by auger without disturbing the surface. All incidentals and appurtenant operations necessary for the construction of the casing and pipe shall be done in strict accordance with the drawings, applicable permits, and other terms and conditions of the contract. Should there be conflicts between this specification and the governing agency, the more restrictive condition shall apply.

The contractor shall furnish all equipment, tools, labor and materials required for the construction as shown and specified.

All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference, shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace at his own expense, should the material be defective in manufacture or damaged in delivery. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

- 1.2 Submittals - Submittals shall be provided for the following items:

- Casing, size, thickness, and material
- Construction method
- Skid configuration
- Pit bracing
- Carrier pipe type

- 1.3 Permits - All work shall conform to the specifications and requirements of the agency having jurisdiction. The contractor shall secure all required permits for construction of casing pipe installation.

- 1.4 Safety - It shall be the contractor's responsibility to see that the work is done in conformance with Cal-OSHA and all other applicable laws and regulations.

2.0 MATERIALS

- 2.1 Casing - Steel casing pipe shall conform, as a minimum, to ASTM A283, Grade C. All casing is required to be either straight seam or seamless steel. Used pipe for casing shall be allowed if it meets the same specifications as new pipe that is used for casing.

Minimum wall thickness for steel pipe casing shall be as shown on the table that follows the casing specifications. However, in no case shall wall thickness be less than ¼-inch.

Lap weld or corrugated pipe, shall not be used for boring.

All casing length shall be equal to the auger length.

- 2.2 A. Tolerances for Casing - The outside diameter (O.D.) shall be as follows:

- 4 ½ inches O.D. through 18 inches O.D. ±0.75%
- 20 inches O.D. and larger ±1.00%

For casing used in any one bore, maximum variation within above tolerances between maximum and minimum outside diameter shall not exceed ¼-inch from 6 inches to 48 inches and ½-inch over 54 inches.

The wall thickness at any and all places on steel casing shall be as follows:

- 4 inches through 18 inches +15.0% -12.0%
- 20 inches and larger +17.5% -10.0%

- B. Lengths and Ends - Unless otherwise agreed, the casing shall be square cut by mechanical methods. Torches held by machinery shall be considered to meet this requirement. The lengths shall be even multiples of 10 feet (i.e. 10 feet, 20 feet, 30 feet, 40 feet, etc.) unless otherwise specified by the boring contractor. This does not apply to field cutting.

- C. Straightness - Casing shall be measured by the cord method with either string or wire stretched taut to take out all visible sag. Maximum cord measured along the casing shall be true length x0.02%. This shall be measured on actual lengths before loading for delivery to the jobsite.

D. Minimum Wall Thickness for Casing - If not shown on the plans, the minimum wall thickness shall be as follows:

| <u>Casing Size</u> | <u>0 to 100' Length</u> | <u>100' to 200' Length</u> |
|--------------------|-------------------------|----------------------------|
| 16"-18" | 1/4" | 3/8" |
| 20"-26" | 5/16" | 5/16" |
| 28"-32" | 3/8" | 3/8" |

E. Lead Joint - The lead joint, where called for, shall be 10 feet long and 1 ½ times the wall thickness of the casing being used.

F. Grout Ports - For casing sizes 30 inches and larger, inside grout ports shall be provided. Location and frequency of the ports shall be approved by the engineer.

2.3 Grout - Grout shall consist of one part Portland cement, water, and four parts sand. Sand shall be of a fineness that 100% passes a standard 8-mesh sieve and at least 45%, by weight, passes the 40-mesh sieve.

2.4 Carrier Pipe - Carrier pipe shall be either ductile iron pipe or polyvinyl chloride (PVC) conforming to the applicable pipe technical specification.

2.5 Skids - Skids shall be pressure treated fir, heart redwood, or polyurethane. Skid straps shall be stainless steel.

2.6 Backfill - The void between the earner pipe and casing shall be filled with blown sand or grout as shown on the plans.

3.0 EXECUTION

3.1 Bore and Receiving Pits - The trench for boring operations shall be adequately shored to safeguard existing substructures and surface improvements and to ensure against ground movement in the vicinity of the casing portal.

The foundation of the approach pit shall be prepared to provide firm support for the guide rails and boring machinery. Pits shall be of sufficient size to allow free insert of the lengths of casing pipe. All rails and support members shall be anchored to ensure that the action of the jacks is in line with the axis of the casing.

All pits shall be fenced and/or a type "K" barrier placed for protection. Pits to be left open overnight shall have a six-foot high fence, in panel sections, securely fastened together for predesign safety. Reflectors shall be secured to the side of the fence that faces traffic.

- 3.2 Alignment and Grade - Where tolerances are not shown on the plans, the horizontal tolerance for pressure and gravity pipeline shall be 1% left or right, from the survey line.

Vertical tolerance for pressure pipelines shall be 1% up or down from the grade line. No vertical tolerance is allowed for gravity flow pipelines.

- 3.3 Boring - Casing sections shall be joined by full-circumference butt welding in the field. The contractor shall prepare ends of casings for welding by providing a ¼-inch x 45 degree chamfer on the ends to be welded.

The end of the steel casing pipe shall be kept immediately behind the cutterhead of the boring machine. The bored hole shall have a diameter no greater than 1 inch larger than the steel casing pipe.

- 3.4 Grouting - Immediately after completion of the jacking or boring operation, lean grout shall be injected through the grout connections of casings 30 inches and larger in a manner that will completely fill all voids outside the casing pipe resulting from the boring operation. Grout pressure is to be controlled so as to avoid deformation of the casing and/or movement of the surrounding ground. After completion of grouting, the grout connections shall be closed with cast-iron threaded plugs.

Voids, created by casings smaller than 30 inches, shall be grouted from ground surface.

- 3.5 Carrier Pipe Installation - The carrier pipe shall be pushed into the casing pipe using skids in accordance with the detail.

It shall be the responsibility of the contractor to secure the carrier pipe in a manner satisfactory to the District Representative to prevent "floating" and subsequent loss of grade when the annular space between the casing pipe and the carrier pipe is filled.

Before backfilling the annular space, the carrier pipe shall pass an initial pressure or leakage test.

- 3.6 Backfill - The annular space between the carrier pipe and the jacked casing shall be filled with air blown sand.

- 3.7 Sealing Ends of the Casing - The annual spaces at the ends of the casing shall be sealed with Class B concrete a minimum of six inches thick or brick and mortar.

- 3.8 Closing the Jacking Pit - After jacking equipment and muck from the tunnel have been removed from the approach trench of the jacking pit, the

contractor shall prepare the bottom of the jacking pit as a pipe foundation. Loose and disturbed material below pipe grade to undisturbed earth shall be removed and then replaced and compacted in eight-inch lifts.

END OF SECTION

ASPHALT PAVING NON-COUNTY ROADS

1.0 GENERAL

1.1 Scope - This specification governs materials and installation for hot mix asphalt on prepared subgrade or aggregate base course to lines, grades and compacted thickness as indicated on the Drawings for non-county roads only. This specification also includes all temporary cold mix asphalt as approved by the District for non-county roads.

1.2 Submittals

Hot Mix Design:

- A. Contractor shall submit the proposed asphalt concrete mix design and test results which conform to these specifications. The proposed mix design shall be reviewed and approved by the Engineer prior to commencing work.
- B. Contractor shall provide a hot mix design that conforms to the applicable requirements as part of this specification and complies with the following design requirements set forth in Section 39-1.03B of the CALTRANS Standard Specifications.

| Quality Characteristic | Test Method | HMA Type | | |
|----------------------------------------|---------------------|-----------|-----------|------------------------|
| | | A | B | RHMA-G |
| Air Voids Content (%) | CT 367 ^a | 4.0 | 4.0 | Special Provisions |
| Voids in mineral aggregate (% min) | LP-2 | | | |
| No. 4 grading | | 17.0 | 17.0 | -- |
| 3/8" grading | | 15.0 | 15.0 | -- |
| 1/2" grading | | 14.0 | 14.0 | 18.0-23.0 ^b |
| 3/4" grading | | 13.0 | 13.0 | 18.0-23.0 ^b |
| Voids filled with asphalt (%) | LP-3 | | | |
| No. 4 grading | | 76.0-80.0 | 76.0-80.0 | Noted |
| 3/8" grading | | 73.0-76.0 | 73.0-76.0 | |
| 1/2" grading | | 65.0-75.0 | 65.0-75.0 | |
| 3/4" grading | 65.0-75.0 | 65.0-75.0 | | |
| Dust proportion | LP-4 | | | Noted |
| No. 4 and 3/8" gradings | | 0.9-2.0 | 0.9-2.0 | |
| 1/2" and 3/4" gradings | | 0.6-1.3 | 0.6-1.3 | |
| Stabilometer value (min.) ^c | CT 366 | | | |
| No. 4 and 3/8" gradings | | 30 | 30 | -- |
| 1/2" and 3/4" gradings | | 37 | 35 | 23 |

Notes:

- Calculate the air voids content of each specimen using California Test 309 and Lab Procedure LP-1. Modify California Test 367, Paragraph C5, to use the exact air voids content specified in the selection of OBC.
- Voids in mineral aggregate for RHMA-G must be within this range.
- Modify California Test 304, Part 2.B.2.c: "After compaction in the compactor, cool to 140° ± 5°F by allowing the briquettes to cool at room temperature for 1/2-hour, then place the briquettes in the oven at 140°F for a minimum of 2 hours and not more than 3 hours.
- Report this value in the job mix formula submittal.

C. Mix shall have a tensile strength ratio of at least 70, as determined by California Test 371.

Cold Mix Design:

A. The aggregate and asphalt shall be thoroughly mixed so that the asphalt material is uniformly distributed throughout and a minimum of 90% of the aggregate particles are uniformly coated when placed on the roadway. Prior to commencing work, it shall be the responsibility of the contractor to submit to the Director one of the following mix designs.

| Sieve Size | Stabilize Base | Dense Binder | Dense T&L | Dense Top | Open Binder | Open Top |
|-----------------|----------------|--------------|-----------|-----------|-------------|----------|
| 2" | 100 | | | | | |
| 1.5" | | 100 | | | 100 | |
| 1" | | 95-100 | | | | |
| 3/4" | | | 100 | | 90-100 | |
| 1/2" | | 60-90 | 90-100 | 100 | 30-100 | 100 |
| 3/8" | | | | 85-100 | 10-60 | 85-100 |
| #4 | 25-65 | 30-70 | 30-75 | 50-90 | 0-25 | 10-50 |
| #8 | | 20-60 | 20-65 | 25-65 | 0-10 | 0-15 |
| #30 | | 8-35 | 8-35 | 8-35 | | |
| #50 | | 3-20 | 3-20 | 3-20 | | |
| #200 | 0-100 | 0-3 | 0-3 | 0-3 | 0-2 | 0-2 |
| % Bitumen | | | | | | |
| | 2.5-4 | 3-4.7 | 3.3-5 | 4-5.8 | 2.8-4 | 3-4.4 |
| Gal/Ton Cutback | | | | | | |
| | 7-14 | 8-13 | 9-14 | 11-16 | | |

2.0 MATERIALS

2.1 Hot Mix Asphalt

- A. Asphalt Binder: Steam-refined paving asphalt conforming to Section 92-1.02B "Grades" of the CALTRANS Standard Specifications. Contractor shall furnish asphalt in conformance with the CALTRANS "Certification Program for Suppliers of Asphalt".
- B. Tack Coat: Grade SC-70, conforming to Section 93-1.01 of the CALTRANS Standard Specifications.
- C. Hot mix asphalt shall be produced in a batch mixing plant or a continuous mixing plant in accordance with Section 39-1.08 of the CALTRANS Standard Specifications.

2.2 Slurry Seal

- A. Slurry seal, Type II, shall be applied in conformance with the provisions in Section 37-2, and all applicable referenced sections of the CALTRANS Standard Specifications, where indicated on the drawings.

2.3 Hot Mix Asphalt Equipment

- A. Spreading and Compacting Equipment:
 - 1. Spreading equipment shall conform to Section 39-1.10 and all applicable referenced sections, of the CALTRANS Standard Specifications. Only in areas inaccessible to the machine, by approval of the Engineer, will hand spreading be permitted.
 - 2. Compaction equipment shall conform to Section 39-1.10 and all applicable referenced sections, of the CALTRANS Standard Specifications.

3.0 EXECUTION

3.1 Examination

- A. Verification of Conditions - Verify surfaces and site conditions are ready to receive work. If unsatisfactory conditions exist, Engineer reserves the right to stop installation until such conditions have been corrected. Beginning application means acceptance of existing conditions.

3.2 Hot Mix Asphalt Project Conditions

- A. Placement of hot mix asphalt shall be performed only when surface is dry and when atmospheric temperature is above 50°F.
- B. Do not place hot mix asphalt when weather is foggy, rainy nor when base on which material is to be placed is in wet or frozen conditions nor when, in the opinion of the Engineer, weather conditions will prevent proper handling, finishing, and/or compaction of the mixtures.

3.3 Hot Mix Asphalt Preparation

- A. All asphalt shall be saw cut prior to placement of new asphalt. Any trench crossing a driveway shall be saw cut in such a way to not cause any detriment to the existing driveway. Any saw cutting to private driveways or roads shall be marked prior to any work for review and approval by the Engineer. No saw cut shall take place without prior approval of the Engineer.
- B. Protect concrete pavements and walks, curbs and bases, and other improvements adjacent to the operations with suitable materials.
- C. Building and other surfaces shall be covered with paper or other protection, when required.
- D. Contractor shall be responsible for any damage caused by Contractor's employees. All damage caused by the contractor's operations shall be repaired to the satisfaction of the Engineer at no additional cost to the property owner.
- E. Immediately prior to applying tack coat the subgrade to receive hot mix asphalt shall conform to the compaction requirement and elevation tolerances specified for the material involved and shall be cleaned to remove any loose or extraneous material.

3.4 Tack Coat

- A. A tack coat of asphaltic emulsion shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, or as otherwise specified herein. A tack coat shall only be applied in advance of hot mix asphalt.
- B. Tack coat shall be applied in one application at a rate of 0.1 gallons per square yard of surface covered.

- C. If the hot mix asphalt is to be placed on an existing base or pavement which was not constructed as part of the contract, the contractor shall clean the surface by sweeping, flushing, or other means to remove all loose particles of paving, all dirt and all other extraneous material immediately before applying the tack coat.

3.5 Hot Mix Asphalt

- A. Hot mix asphalt shall be handled in such a way that the temperature is controlled to the best of the contractor's ability. The asphalt shall remain in the delivery truck until placement and shall not be temporarily placed in staging or storage area. Transport the mixture from the mixing plant to the point of use in vehicles having tight bodies previously cleaned of all foreign materials. Cover each load with canvas or other suitable material of sufficient size and thickness to protect the asphalt mixture from the weather.
- B. Placing materials in a windrow, then picking it up and placing it in the asphalt paver with loading equipment will be permitted provided that:

- 1. Hot mix temperatures:

| | |
|-------------------------|-----------|
| Asphalt Arrives On Site | 275-325°F |
| Asphalt Is Rolled Above | 185°F |

- 2. The asphalt paver is of such design that the material will fall into a hopper which has a movable bottom conveyor to feed and screed.
- 3. The loader is constructed and operated so that substantially all of the material deposited into windrows is picked up and deposited into the paving machine.
- 4. The windrow is deposited only so far in advance of the paver to provide for continuous operation of the paver and not so far as to allow the temperature of the Hot mix asphalt in the windrow to fall below 185°F.
- 5. Asphalt mixtures shall not be handled, spread or windrowed in a manner that will stain the finished surface of any pavement or other improvements.
- 6. The completed mixture shall be deposited on the prepared subgrade at a uniform quantity per linear foot, as necessary

to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture.

- C. Spreading - All layers of hot mix asphalt shall be spread with an asphalt paver and shall conform to Section 39-1.11 and all applicable referenced sections of the CALTRANS Standard Specifications. At locations where the hot mix asphalt is to be placed over areas inaccessible to spreading and rolling equipment, all layers of hot mix asphalt shall be distributed directly out of the back of the dump truck and spread by hand. hot mix asphalt spread by hand shall be compacted thoroughly to the required lines, grades and cross-sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

- D. Compaction - A pass shall be on movement of a roller in either direction. A coverage shall be as many passes as are necessary to cover the entire width being paved. Overlap between passes during any coverage, made to ensure compaction without displacement of material in accordance with good rolling practice, shall be considered to be part of the coverage being made and not part of a subsequent coverage. Each coverage shall be completed before subsequent coverages are started.

Rolling shall commence at the lower edge and shall progress toward the highest portion, expect that when compacting layers which exceed 0.25-foot in compacted thickness, and if directed by the Engineer, rolling shall commence at the center and shall progress outwards.

Compacting of open graded asphalt concrete shall consist of two coverages. If necessary, only one coverage of the open graded asphalt concrete may be ordered by the Engineer to prevent a break in the bond of asphalt between the aggregate particles.

All other asphalt concrete and asphalt concrete base shall be compacted as follows:

Initial or breakdown compaction shall consist of three coverages of a layer of asphalt mixture and shall be performed with a 2-axle or 3-axle tandem or a 3-wheel roller weighting not less than 12-tons. Where the thickness of the layer of asphalt mixture is less than 0.15-foot, fewer coverages than specified above may be ordered by the Engineer if necessary to prevent damage to the layer being compacted. The initial or breakdown compaction shall be followed

immediately by additional rolling consisting of three coverages with a steel-tired roller weighing not less than 8-tons at a temperature above 185° F. Each layer of asphalt concrete and asphalt concrete base shall be compacted additionally without delay by a final rolling consisting of not less than one coverage with a steel-tired roller weighing not less than 8-tons. Except as otherwise provided for low rates of production, a separate finish roller will be required.

Rolling shall be performed so that cracking, shoving, or displacement will be avoided. Rolling where 3-axle tandem rollers may be used shall be under the control of the Engineer, but in general, no 3-axle tandem roller shall be used in rolling over a crown or a warped section when the center axle is in the locked position.

Provided it is demonstrated to the satisfaction of the Engineer that one roller can performed the work, the required minimum rolling equipment specified may be reduced to a 2-axle tandem roller, weighing at least 8-tons for each paver under any of the following conditions.

1. When asphalt concrete or asphalt concrete base is placed at a rate of 50-tons, or less, per hour at any location.
2. When asphalt concrete or asphalt concrete base is placed at a rate of 100-tons, or less, per hour and at the locations or under the conditions as follows:
 - Placed on miscellaneous areas as approved by the Engineer; or
 - When the width to be placed is less than 8-feet.

When rolling equipment is reduced as provided in this section the rolling requirements may be reduced to at least three complete coverages with the tandem roller.

Upon completion of rolling operations, if ordered by the Engineer, the asphalt concrete or asphalt concrete base shall be cooled by applying water.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations, or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the

asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the contractor.

- E. Segregation shall be avoided and the surfacing shall be free of pockets of coarse or fine material. hot mix asphalt containing hardened lumps shall not be used. In areas inaccessible to paving and compacting equipment where spreading is done by hand, minimize the amount of segregation.
- F. At all locations, or as directed by the Engineer, the asphalt concrete shall be square and at least 2 inches thick when conforming to existing surfacing.
- G. Upon completion of final rolling, traffic shall not be permitted on the finished pavement for at least 4 hours, or until the Hot mix asphalt has cooled sufficiently to withstand traffic without being deformed as determined by the Engineer.

3.6 Cold Mix Asphalt

- A. Cold mix asphalt shall be placed before the end of each work day (where approved by the District) for newly installed pipeline trenches.
- B. Compact the cold mix asphalt material with a smooth drum roller, vibratory plate, or approved compaction equipment. Equipment to be used for compaction is subject to review and rejection by the Engineer. Contractor is responsible for adequately grading and compacting cold mix to the satisfaction of District and the Engineer.
- C. Contractor is responsible for all maintenance of cold mix up to the installation of the final pavement. Contractor is required to make repairs to cold mix as necessary and/or directed by the Engineer.

3.7 Hot Mix Field Quality Control

- A. All hot mix asphalt shall match the grades indicated on the Drawings and shall be completely free from unintended hollows and high spots.
- B. Cracks, settling of surface, improper drainage, improper compaction, and sloppy connection to previously laid surfaces will be construed as improper workmanship and will not be accepted.

3.8 Striping

- A. All striping removed or damaged during hot mix installation shall be corrected within one week of final pavement. If damage occurs before final pavement is scheduled the contractor in the interim can temporarily use marking paint for the stop bar until the final striping is scheduled.
- B. Standard striping is required at elevations above 2,500 feet and thermoplastic is required where previously used below 2,500 feet. The contractor is responsible to use either product that matches the existing striping.

3.9 Workmanship and Warranty

- A. Contractor shall provide written warranty against defects in materials or workmanship for a period of not less than one year upon acceptance of work.

END OF SECTION

SEWER SYSTEM TESTING

1.0 GENERAL

- 1.1 Scope - This section governs the testing requirements and procedures for acceptance of all completed sewer lines, manholes, and force mains.

It is the intent of the plans and specifications that the completed sewer pipes along with manholes and other appurtenances shall be watertight.

All sewer pipes shall be air tested for leakage. Gravity sewer mains, including services, shall also be visually inspected by video camera and tested for deflection by a mandrel. Manholes shall be hydrostatically tested for infiltration.

All tests shall be made in the presence of the District.

Even though a section may have previously passed the leakage test, each section of sewer shall be tested subsequent to the last backfill compacting operation if, in the opinion of the District heavy compaction equipment or any of the operations of the contractor or others may have damaged or affected the structural integrity or water tightness of the pipe, structure, and appurtenances.

OFFICIAL DISTRICT TESTING WILL NOT BE PERMITTED UNTIL AFTER ALL OTHER UNDERGROUND FACILITIES HAVE BEEN INSTALLED AND THEIR TRENCH COMPACTION VERIFIED.

When lines to be tested are in areas that will be paved, testing shall be done after the rock subgrade is placed and compacted.

- 1.2 Acceptance - The sewer will not be considered acceptable until the leakage or infiltration rate, as determined by test, is less than the maximum allowable.

If the leakage or infiltration rate is greater than the amount specified, the pipe joints shall be repaired or, if necessary, the pipe shall be removed and relayed by the contractors, and retested.

- 1.3 Submittals - The contractor shall notify the District a minimum of 3 business days in advance of its proposed testing schedule for review and concurrence.

2.0 MATERIALS

- 2.1 General - All test equipment, valves, plugs, or other control equipment and materials shall be determined and furnished by the contractor, subject to District review. No materials shall be used which would be injurious to the construction or its future function.

3.0 EXECUTION

- 3.1 Mandrel Test for Gravity Sewers - After completion of the sewer line, the line shall be ball flushed just prior to pulling the mandrel through.

A commercially manufactured, rigid, odd-numbered leg (9 legs minimum) mandrel, with a circular cross section having a diameter of at least 95% of the specified average inside diameter, shall be pulled through the pipe by hand. The minimum length of the mandrel shall be equal to the base inside diameter of the pipe. Obstructions encountered by the mandrel shall be corrected by the contractor.

- 3.2 Air Test for Gravity Sewers - After the mandrel test, each section of sewer between successive manholes shall be air tested as follows:

- A. With all outlets plugged, air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pipe shall have a relief valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig.
- B. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig.
- C. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured. The results shall not be less than the minimum permissible duration for the air test pressure drop shown in Table I.

TABLE I
MINIMUM TIME FOR
AIR PRESSURE DROP OF 0.5 PSIG

| Pipe Diameter (in.) | Time for Length Shown (in Minutes/Seconds) | | | | |
|---------------------|--------------------------------------------|----------|----------|----------|----------|
| | 0-200' | 201-250' | 251-300' | 301-350' | 351-400' |
| 6 | 2:50 | 2:50 | 2:50 | 2:50 | 2:50 |
| 8 | 3:50 | 3:50 | 3:50 | 4:30 | 5:00 |
| 10 | 4:40 | 5:00 | 6:00 | 7:00 | 7:50 |
| 12 | 5:40 | 7:10 | 8:30 | 10:00 | 11:20 |

- D. Should groundwater be present above the flowline of the pipe, the air pressure added to the 3.5 psig criteria shall be calculated by dividing the vertical height, in feet of groundwater above the flowline, by 2.31. The starting test pressure shall not exceed 9.0 psig.
- E. If the time shown in Table I for the designated pipe size and length elapses before the air pressure drops 0.5 psig; the section being tested shall have passed and the test discontinued.

3.3 Manhole Test - Water tightness of manholes may be tested in connection with tests of sanitary sewers or at the time the manhole is completed and backfilled. The test shall be as follows:

- A. The contractor shall plug all inlets and outlets with approved stoppers or plugs.
- B. The manhole shall be filled with water to the top of the frame.
- C. The water shall stand in the manhole for a minimum of one hour to allow the manhole material to reach maximum absorption.
- D. The contractor shall refill the manhole to the original depth.
- E. The time of the test will be determined by the District to fit the various field conditions.
- F. The manhole shall be refilled to the original depth and the amount of water required to fill the manhole shall be recorded.
- G. If the amount of water added does not exceed the limits shown in Table II, then the manhole has passed the test.

TABLE II

| <u>Depth of Manhole (ft.)</u> | <u>Allowable Amount of water added (gal.)</u> |
|-------------------------------|-----------------------------------------------|
| 0-5 | 1 |
| 6-7 | 1-1/2 |
| 8-10 | 2 |
| 11-12 | 2-1/2 |
| 13-15 | 3 |
| 16-18 | 3-1/2 |
| 19-20 | 4 |

- H. Even though the leakage may be less than the specified amount, the contractor shall stop any leaks that may be observed to the satisfaction of the District.
- I. For manholes that require lining the inlet(s) and outlet shall be mandrel tested after the lining is applied to verify flowline has not been compromised.

3.4 Video Test- All sewer collectors and laterals shall be T.V. inspected prior to pavement placement in accordance to the following:

- A. The complete job is ready for television inspection when the following work has been completed and approved by the District:
 1. All sewer pipelines are installed, backfilled, and compacted.
 2. All manholes are in place, all channeling is complete and pipelines are accessible from manholes, and testing completed.
 3. All other underground facilities, utility piping and conduits are installed.
 4. Final sub grade is complete. For wet weather periods, placement of aggregate base has been completed.
 5. Pipelines to be inspected have been cleaned and flushed per Section 3.1.
 6. Final air test has been completed per Section 3.2.
- B. After the above work is complete, the contractor shall schedule the video inspection. The video test shall be done in the presence of the District's inspector. Water is to flow through the lines for 12

hours prior to the T.V. work. During the video for service, some water must be flowing for camera orientation. The camera shall have a device to measure depths.

- C. If no deficiencies are observed, the work will be considered satisfactory.
- D. A videotape will be made .and given to the District, and defects serious enough to require correction will be determined by the District.
- E. Notification will be made in writing of any deficiencies revealed by the video that will require repair. If corrective work is indicated and viewing of the videotapes is desired, the District shall be contacted to set a time for the viewing with the Engineer.
- F. Corrective work shall be done. District reserves the right to require another test of any repair.
- G. Those portions of the pipeline system that have been corrected will be re-inspected.
- H. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to paving:
 - 1. Low spots, 1/2-inch and greater
 - 2. Joint separations
 - 3. Cocked joints present in straight runs or on the wrong side of pipe curves
 - 4. Cracked or damaged pipe
 - 5. Dropped joints
 - 6. Infiltration
 - 7. Debris or other foreign objects
 - 8. Other obvious deficiencies
 - 9. Irregular condition without logical explanation
 - 10. Standing water in service laterals

- 3.5 Sewer Force Main Test - Leakage test for sewer force mains shall follow the procedures set forth in Technical Specification 33 13 00 "Testing and Disinfecting Water Mains" Subsection 3.2.

All defective elements shall be repaired, or removed and replaced, and then retested until all visible leakage has been stopped and the allowable leakage requirements have been met.

END OF SECTION

DUCTILE IRON PIPE AND FITTINGS
(PRESSURE FLOW) (UNDERGROUND)

1.0 GENERAL

- 1.1 Scope - This specification governs the furnishing and installation of ductile iron pipe material and main line fittings including laying, joining, bedding and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract.

Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.

The contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.

All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference, shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him, and shall replace, at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

The contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

- 1.2 Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

- Pipe and joint material
- Fittings
- Specialties

2.0 MATERIALS

2.1 Ductile Iron Pipe (DI) - Ductile iron pipe shall conform to the quality and strength requirements of AWWA C-151.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:

- The letters "DI" or "Ductile"
- Nominal size and class
- Year produced
- Manufacturer's trade name and country where cast
- Seal (mark) of testing agency

B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 350.

C. Laying Length - Standard laying lengths of 18- or 20-foot is acceptable.

D. Joint Type - Unless otherwise shown or specified, pipe joints shall be rubber gasket push-on type joint conforming to AWWA C-111.

1. Flanged Joint - Where flanged joints are specified, pipe barrel shall be threaded and fitted with flanges in accordance to AWWA C-115 "Flanged Ductile Iron Pipe with Threaded Flanges."

E. Physical Test Requirements - Hydrostatic, tension test, and impact test shall be conducted at the factory in accordance with ASTM A746. All testing shall be performed by a recognized testing laboratory with such testing available for inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.

F. Lining and Coating - The inside surfaces shall be cement mortar lined in accordance with ANSI/AWWA C-104/A21.4. The outside coating shall be an asphaltic coating per AWWA C-151.

G. Polyethylene Encasement - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to AWWA C-105, latest revision. Minimum thickness shall be 0.008 inch (8 mils).

H. Warning Tape - Two-inch-wide non-metallic tape marked "waterline."

2.2 Fittings - All cast and ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C-104, "Cement-Mortar Lining for Ductile-Iron Pipe and Gray-Iron and Fittings for Water", C-110, "Gray-Iron and Ductile-Iron Fittings, 3 inches through 48 inches for Water and Other Liquids", C-111, "Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings", with the following additional requirements or exceptions. All fittings shall be furnished with a cement-mortar lining of standard thickness as defined in referenced specifications.

All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints.

Ductile iron compact fittings, per AWWA C-153, are allowed.

A. Flanges. Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of manufacturer and with the AWWA Class; i.e., "E", or pressure rating.

Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin. Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.

Gaskets shall be 1/8-inch thick and be of the full-face self-centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

| <u>Pipe Size</u> | <u>Bolt Hole Diameter (Inches)</u> | <u>Bolt Diameter & Length (Inches)</u> | <u>Number of Bolts</u> |
|------------------|------------------------------------|--------------------------------------------|------------------------|
| 6" | 7/8 | 3/4 x 3 1/2 | 8 |
| 8" | 7/8 | 3/4 x 3 1/2 | 8 |
| 10" | 1 | 7/8 x 4 | 12 |
| 12" | 1 | 7/8 x 4 | 12 |
| 14" | 1 1/8 | 1 x 4 1/2 | 12 |
| 16" | 1 1/8 | 1 x 4 1/2 | 16 |
| 18" | 1 1/4 | 1 1/8 x 5 | 16 |

The contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

- B. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts. T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

| <u>Pipe Size</u> | <u>Number of Bolts</u> | <u>Bolt Diameter & Length (Inches)</u> |
|------------------|------------------------|--------------------------------------------|
| 6" | 6 | 3/4 x 3 1/2 |
| 8" | 6 | 3/4 x 4 |
| 10" | 8 | 3/4 x 4 |
| 12" | 8 | 3/4 x 4 |
| 14" | 10 | 3/4 x 4 |
| 16" | 12 | 3/4 x 4 1/2 |
| 18" | 12 | 3/4 x 4 1/2 |

- C. Restrained Joints - Restrained joint pipe and fittings shall be U.S. Pipe TR FLEX or approved equal.

- D. Coatings and Linings - Cast iron fittings shall be cement mortar lined per AWWA C-104 and receive a bituminous coating per AWWA C110.

Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating of materials, or mortar on gasket grooves.

- E. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.

1. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.

2. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

3.0 EXECUTION

- 3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

- A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

3.2 Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

- A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.

- B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.

- C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the contractor for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the District's attention.

- D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District's Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

- E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces, shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

- F. Allowable Deflection - The maximum allowable angular deflection at the joints shall be 80% of manufacturer's recommendation for push-on and mechanical joints.

3.3 Fittings - Fittings shall be installed in the manner specified herein.

- A. Anchorage for Fittings - All fittings shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.
- B. Thrust Blocks - Thrust blocks shall be constructed of Class B concrete. Care shall be taken not to obstruct the outlets of tees or crosses, which are intended for future connections. A waterproof paper or plastic bond-breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal in the future. Thrust blocks shall be poured against undisturbed earth and

shall have at least the minimum dimensions shown in the details on the Standard Drawings.

- C. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations.

Bolt threads shall be lubricated with graphite and oil prior to installation.

1. Painting and Coating

- a. The contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09 90 00 and then wrap the couplings with polyethylene wrap per AWWA C-105.
- b. The contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

- 3.4 Polyethylene Encasement - The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding materials, but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, etc. on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with a minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape.

For installations below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible with adhesive tape at the joint overlap.

Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C-105, Method A. The following summarizes this method.

- A. Installation of Polyethylene Encasement for Pipe - Cut polyethylene tube to a length approximately two feet longer than the pipe section. Slip the tube around the pipe, centering it to provide a one-foot overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends.

Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube.

After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.

Any cuts, tears, punctures, or other damage to the polyethylene, shall be repaired as described below. Proceed with installation of the next section of pipe in the same manner.

- B. Installation of Polyethylene Encasement for Appurtenances - Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube, the items shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.
- C. Repairs of Polyethylene Encasement - Repair any cuts, tears, punctures, or damage to polyethylene with adhesive tape, or with a short length of polyethylene sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.
- D. Openings in Polyethylene Encasement - Provide openings for branches, service taps, blowoffs, air valves, and similar appurtenances by making an X-shaped cut in the polyethylene and

temporarily folding back the fill. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as, any other damaged areas in the polyethylene, with any resulting damaged areas being repaired, as described above.

- E. Junctions with Unwrapped Pipe - Where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, extend the polyethylene wrap, to cover the adjacent pipe for a distance of at least three feet away from the ductile iron pipe. Service lines of dissimilar metals shall be wrapped with polyethylene or a suitable dielectric tape for a minimum clear distance of three feet away from the ductile iron pipe.

- 3.5 Testing and Disinfection - Testing and disinfection shall be performed on all pipelines, in accordance with Section 33 13 00.

END OF SECTION

POLYVINYL CHLORIDE PIPE AND FITTINGS (PVC)
(PRESSURE FLOW)

1.0 GENERAL

- 1.1 Scope - This specification governs the furnishing and installation of PVC pipe material and main line fittings including laying, jointing, bedding, and approvals. All incidentals and appurtenant operations necessary for the construction of water mains shall be done in strict accordance with the drawings and other terms and conditions of the contract. Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.

The contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.

All standard specifications; i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

- 1.2 Storage and Care - The contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept, free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation. Gaskets shall be protected

from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers from excessive heat.

1.3 Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

2.0 MATERIALS

2.1 Polyvinyl Chloride Pipe (PVC) - PVC pipe shall conform to AWWA C-900, titled "Polyvinyl Chloride Pipe (PVC) Pressure Pipe 4 Inches through 12 Inches for Water" and shall have the same outside diameter (O.D.) as that of cast iron pipe (C.I.P.O.D.) in the sizes furnished.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:

- Nominal size and O.D. base; i.e., six-inch cast iron pipe size
- Material code "PVC 1120"
- Dimensional ratio; i.e., DR 18 where DR is equal to thickness "divided by" diameter
- AWWA pressure class; i.e., PC 150
- AWWA designation "AWWA C-900"
- Manufacturer's trade name and production record code
- Seal (mark) of testing agency

B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 150.

C. Laying Length - The standard laying length shall be 20 feet (plus or minus 1 inch) in all classes. A maximum of 15% may be furnished in random lengths of not less than 10 feet each.

D. Joint Type - Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint or using machined couplings of a sleeve type with rubber ring gaskets and machined pipe ends to form a push-on type joint.

Solvent cement joints are strictly prohibited.

One coupling complete with one gasket each shall be factory assembled to each length of standard length pipe furnished. The companion gasket for each coupling will be packaged separately for shipment. Couplings shall be the same class as the pipe. Manufacturer shall furnish gasket lubricant for each quantity of pipe furnished. When additional couplings are furnished as separate items, two gaskets shall be furnished and installed in the gasket recess of each coupling.

1. Couplings - Where couplings are used, they shall meet the requirements of AWWA C-900. Couplings shall be as furnished by the manufacturer. Couplings shall be marked with same information as the pipe.

E. Physical Test Requirements - Hydrostatic burst and sustained pressure and crushing tests shall be conducted at the factory in accordance with AWWA C-900. All testing shall be subject to inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.

F. Locating Wire - Locating wire shall be single strand, 10-gauge copper wire, with solid thermoplastic insulation.

G. Warning Tape - Warning tape shall be two-inch-wide non-metallic tape marked "waterline."

2.2 Fittings - All cast and ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C104, "Cement-Mortar Lining for Ductile-Iron Pipe and Gray-Iron and Fittings for Water," C110, "Gray-Iron and Ductile-Iron Fittings, 3 Inches through 48 Inches for Water and Other Liquids". C111, "Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings," with the following additional requirements or exceptions. All fittings shall be furnished with a cement-mortar lining of standard thickness as defined in referenced specifications.

All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints except where specifically shown otherwise on the plans or Standard Drawings.

Ductile iron compact fittings, per AWWA C153, are allowed.

A. Flanges, Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub type flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of the

manufacturer and with the AWWA Class; i.e., "E", or pressure rating.

Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin.

Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.

Gaskets shall be 1/8-inch thick and be of the full face self centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

| <u>Bolt Hole Pipe Size</u> | <u>Diameter (Inches)</u> | <u>Bolt Diameter & Length (Inches)</u> | <u>Number of Bolts</u> |
|----------------------------|--------------------------|--------------------------------------------|------------------------|
| 6" | 7/8 | 3/4 x 3 1/2 | 8 |
| 8" | 7/8 | 3/4 x 3 1/2 | 8 |
| 10" | 1 | 7/8 x 4 | 12 |
| 12" | 1 | 7/8 x 4 | 12 |
| 14" | 1 1/8 | 1 x 4 1/2 | 12 |
| 16" | 1 1/8 | 1 x 4 1/2 | 16 |
| 18" | 1 1/4 | 1 1/8 x 5 | 16 |

The contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

- B. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts.

T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

| <u>Pipe Size</u> | <u>Number of Bolts</u> | <u>Bolt Diameter & Length (Inches)</u> |
|------------------|------------------------|--------------------------------------------|
| 6" | 6 | 3/4 x 3 1/2 |
| 8" | 6 | 3/4 x 4 |
| 10" | 8 | 3/4 x 4 |
| 12" | 8 | 3/4 x 4 |
| 14" | 10 | 3/4 x 4 |
| 16" | 12 | 3/4 x 4 1/2 |
| 18" | 12 | 3/4 x 4 1/2 |

- C. Coatings and Linings - Cast iron fittings shall be cement mortar lined per AWWA C-104 and receive a bituminous coating per AWWA C110.

Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating materials or mortar in gasket grooves.

- D. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.
1. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
 2. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

3.0 EXECUTION

- 3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

- A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and should not be exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.
- 3.2 Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein and in the plans.
- A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.

- B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects just prior to installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.
- C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the contractor, for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the District's attention.

- D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps to be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in, accordance with the manufacturer's instructions. Rubber rings and ring grooves shall not be lubricated. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

- E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory-finished beveled end shall be used as a guide for proper bevel angle (15°) and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using a PVC pipe beveling tool. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file.

When installing 8-, 10- and 12-inch PVC pipe, mechanical joint or push-on type fittings designed for ductile iron pipe shall be used. When connecting PVC pipe into the bell end of cast iron pipe or into push-on type fittings, the end should be rebeveled, similar to the bevel on ductile iron pipe. When connecting to mechanical joint fittings, the end of the PVC pipe should not be beveled.

- F. Allowable Deflection - No deflection shall be allowed at the joints.

The maximum allowable angular deflection at twin-gasketed couplings shall be 5 degrees.

The pipe shall not be bent to a lesser radius than the minimum shown below:

| <u>Size (Inches)</u> | <u>Minimum Radius of Curvature (Feet)</u> |
|----------------------|-------------------------------------------|
| 4 | 190 |
| 6 | 200 |
| 8 | 250 |
| 10 | Fittings Required |
| 12 | Fittings Required |

- G. Locating Wire - Locating wire shall be installed with non-metallic water pipe as indicated on the Standard Drawings.

H. Warning Tape - Warning tape shall be placed on top of pipe zone backfill centered over pipe as shown on the Standard Drawings.

3.3 Fittings - Fittings shall be installed in the manner specified herein for cleaning, laying and joining pipe.

A. Anchorage for Fittings - All fittings, unless otherwise specified, shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.

B. Thrust Blocks - Thrust blocks shall be constructed of Class B Concrete. Care shall be taken not to obstruct the outlets of tees or crosses which are intended for future connections. A waterproof paper or plastic bond-breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal of the concrete in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown on the Standard Drawings.

C. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations.

Bolt threads shall be lubricated with graphite and oil prior to installation.

1. Painting and Coating -

a. The contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 09 90 00 and then wrap the couplings with polyethylene wrap per AWWA C-105.

b. The contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

D. Polyethylene Wrap - All ferrous metal shall be protected with polyethylene wrap. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube the item shall be wrapped with a flat sheet or split length of polyethylene tube by passing the

sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.

Cuts, tears, punctures, or damage to polyethylene shall be repaired with adhesive tape, or with polyethylene sheet secured in place with adhesive tape.

- 3.4 Testing and Disinfection - Testing and disinfection shall be performed on all pipelines in accordance with Section 33 13 00.

END OF SECTION

DIVISION 33 UTILITIES

SECTION 33 12 00.13

ABANDONMENT OF FACILITIES

PART 1 – GENERAL

1.01 SCOPE

- A. This Section governs abandonment of pipelines, services, valve and meter, and other existing structures.

1.02 SUBMITTALS

- A. Upon request, schedules and method of abandonment shall be submitted to the District for approval.
- B. 1-Sack Slurry Mix design and compressive strength test results.
- C. Contractor shall submit for review their abandonment plan for filling the waterlines.

PART 2 – MATERIALS

2.01 GENERAL

- A. Concrete, fittings, backfill material and other material used for abandonment shall comply with Specification 03 30 00 – Cast in Place Concrete and 03 34 00.13 – CLSM.

2.02 FACILITY ABANDONMENT

- A. 4-Inch, 6-Inch, and 8-inch Pipe being abandoned shall be entirely filled with 1-sack slurry cement in accordance with District Standards.
 - 1-sack slurry backfill shall be used on abandoned lines that will no longer be in service or be under any pressure.
- B. Blind flanges shall be used on any lines remaining in service or under pressure.
 - Thrust blocks shall be placed behind blind flange in accordance with District Standards.

PART 3 – EXECUTION

3.01 PIPELINES

A. Procedures (Pipe Abandonment)

All existing pipelines no longer in service or under pressure shall be abandoned in place. The entire pipeline shall be filled with an approved 1-sack slurry to the District Inspector satisfaction. No pipeline shall be abandoned until the new pipeline system and all services are installed, tested, and in service. An abandonment plan must be prepared by the Contractor and approved by the District prior to abandonment of any facilities.

Contractor shall be responsible for the cutting, removal and disposal of pipe, and for the dismantling of any fittings and valves necessary to perform the abandonment. Contractor is made aware that multiple slurry insertion and monitoring locations will be required to ensure adequate abandonment.

Structures to be abandoned shall have all openings, inlets, and outlets sealed off and the structure shall be removed to a point 3 feet below the proposed street grade or ground surface and filled with backfill (compacted as directed) or concrete.

3.02 SERVICE LATERALS

- A. Laterals will be abandoned in place. No portion of the previous service lateral shall be present inside the meter box after abandonment. Service shall be cut and capped below grade to avoid accidental reconnection. All caps shall be approved by the District Inspector.

3.03 STRUCTURES (VALVE BOXES)

- A. Valve boxes to be abandoned shall be removed to a point 12-inches below the proposed street grade or ground surface and filled with ¾-inch crushed rock or cement slurry when in the street and filled with top soil when in unpaved or landscape areas.

3.04 DISPOSAL OF MATERIALS

A. ASBESTOS MATERIALS

It is the specific intent of these Contract Documents to exclude from the Work any and all products or materials containing asbestos. No new products containing asbestos shall be incorporated in the Work.

The Contractor is made aware that the existing water pipelines in the project area are made of Asbestos Concrete (AC). The Contractor shall anticipate the need for removal of sections of the existing pipeline during

tie-ins to the existing system and abandonment of the existing pipelines where indicated on the plans.

All Asbestos Concrete (AC) Pipe shall be handled and disposed of according to California Code of Regulations (CCR) Title 8, Section 1529; or most current regulations. Contractor shall provide a plan for disposal of the AC pipe and provide evidence of proper disposal to the Construction Manager.

END OF SECTION

DOMESTIC SERVICE LINES AND APPURTENANCES

1.0 GENERAL

1.1 Scope - This section governs materials and installation of the following:

- A. Service line materials and fittings
- B. Meter Boxes

1.2 Submittals - The following items shall be submitted for approval by the District.

- A. Manufacturer's catalog data showing model, part number, pressure ratings and materials of construction.

2.0 MATERIALS

2.1 Service Line Materials and Fittings - Service line materials and fittings include service line tubing, service saddles, service fittings, meter stops, corporation stops, curb stops, and ball valves. All service line materials and fittings shall be NSF 61 approved and documentation must be provided in all required submittals.

A. Service Line Tubing (2-inch In Diameter And Smaller):

All service tubing shall be color coded as follows:

| <u>Service Type</u> | <u>Color Indicator</u> |
|---------------------|------------------------|
| Potable | Blue |
| Recycled | Purple |
| Sewer | Green |

i. Polyethylene Tubing (PE) - PE tubing shall be in accordance with AWWA C901 and correspond to copper tubing size (CTS). PE tubing shall only be installed on all non-metallic waterlines. The tubing shall be marked with the following:

- Nominal size
- Material code; i.e., PE 4710
- The word "Tubing" and dimension ratio (DR-9) minimum
- AWWA pressure class; i.e., PC 200
- AWWA designation AWWA C901

- Manufacturer's name or trademark
- Seal of testing agency

The polyethylene material shall be type "4710" conforming to ASTM D3350 and ASTM D2737. The pressure class shall be a minimum of 200 psi. Stainless steel liners or inserts shall be used with PE tubing when compression type connections are specified or shown.

- ii. Copper Tubing (CT) – CT shall be in accordance with AWWA C800 and ASTM B88 Standard Specification for Seamless Copper Water Tube Type K. CT tubing shall only be installed on all metallic waterlines. Additionally, two #4 copper service line anodes with insulated solid copper wire 10 feet long, and a brass cable to pipe clamp shall be installed in each meter box.
- B. Service Saddles - Service saddles shall be constructed of bronze, have AWWA iron pipe thread outlet taps, comply with AWWA C-800 "Underground Service Line Valves and Fittings" and have suitable means for attachment and sealing to a water main. The body shall be made to conform to outside configuration of the main. The service saddle shall be designed to provide a drip-tight connection when used as a service connection to the main. Saddles for ductile iron pipe shall be double strap. Straps for PVC pipe may also be stainless and shall provide full support around the circumference of the pipe and have a bearing area of sufficient width so that the pipe will not be distorted when the saddle is tightened.
 - C. Corporation Stops - Corporation stops shall be constructed of bronze, have AWWA iron pipe inlet threads, and shall comply with the requirements of AWWA C800, "Underground Service Line Valves and Fittings." Outlets connecting to either CT or PE 1-inch and 2-inch corporation stops shall have compression connections.
 - D. Fittings - Fittings including CT or PE couplings, bends, unions, and adapters shall be constructed of bronze and shall be designed to join via a compression connection for 1-inch and 2-inch sizes. Fittings shall also have male or female iron pipe-size-threaded ends and/or meter coupling nut or meter flange as required.
 - E. Angle Meter Stops - Angle meter stops shall be constructed of bronze, have lock wings and be suitable for joining to either CT or PE via a compression connection for 1-inch and 2-inch angle meter stops. Outlets for 1-inch angle meter stops shall consist of a meter

coupling nut. 2-inch angle meter stops shall have meter flange outlets.

- 2.2 Meter Boxes - The meter boxes for 1-inch and 2-inch meters shall be concrete with steel lids in traffic areas. Plastic boxes and lids may be used in non-traffic areas with prior approval, according to the following:

| <u>Meter Size</u> | <u>Box Inside Dimensions (Min.)</u> |
|-------------------|-------------------------------------|
| 3/4 inch, 1 inch | 10 x 17 inches |
| 1½ inch, 2 inch | 13 x 24 inches |

3.0 EXECUTION

3.1 Service Tubing:

Tubing and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure to sunlight for prolonged periods. The manufacturer's recommendations regarding storage should be followed.

Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the conduit.

Pipe excessively cut or kinked shall not be used.

Tubing shall be installed in trench bottoms with six-inches of bedding material to provide continuous and uniform support. The initial backfill shall be six inches above the tubing and material shall be free from rock, stones, and debris. Material above the tubing needs to be the same approved import as the bedding.

Bends in service tubing shall not occur closer than 10 diameters from any fitting or valve. The minimum radius of curvature is 30 diameters or the coil radius when bending with the coil. Bending of coiled tubing against the coil shall not go beyond straight. Service tubing that becomes kinked during handling or installation shall not be used, and care should be taken to ensure that kinking does not develop after installation. Service line from the main line tap to the angle meter stop shall be one continuous length of tubing.

- 3.2 Service Saddles - The service saddle shall be no closer than 36 inches to a valve, other saddle, coupling, joint, or fitting.

The surface of the pipe shall be free of all loose material and have a hard, clean surface before placing the service saddle.

The service saddle shall be tightened firmly and uniformly to ensure a tight seal, however, care shall be used to prevent damage or distortion of either the pipe, corporation stop or service saddle by overtightening.

The drilling of the pipe shall be performed in accordance with the pipe manufacturer's recommendation.

- 3.3 Fittings, Angle Meter Stops, and Boxes - Installation of fittings, meter stops, and boxes shall be as per the requirements of the manufacturer. Pipe or fittings made of nonferrous metals (bronze) shall be isolated from ferrous metals with insulating unions or couplings.
- 3.4 Hydrostatic Testing - The contractor shall hydrostatic test all appurtenances in place with the pipe being tested.

END OF SECTION

DOMESTIC IN-TRACT SERVICE LINES

1.0 GENERAL

1.1 Scope - This section governs materials and installation of the following:

A. In-tract service line materials and fittings from the meter box to the house connection

1.2 Submittals - The following items shall be submitted for approval by the District.

A. Manufacturer's catalog data showing model, part number, pressure ratings and materials of construction.

B. National Sanitation Foundation (NSF) 61 for all fittings, tubing, glue, and other material that have direct contact with water.

2.0 MATERIALS

2.1 In-Tract Service Line Materials and Fittings - Service line materials and fittings shall be new including all service tubing and service fittings. All service line materials and fittings shall be NSF 61 approved and documentation must be provided in all required submittals.

A. Polyvinyl Chloride (PVC) Schedule 80 – Pipe shall be furnished in minimum standard lengths of twenty feet. All in-tract lines shall be buried a minimum of 24” below finish grade. The piping shall be marked with the following:

- Nominal size
- Material code
- NSF 61
- Manufacturer's name or trademark
- Seal of testing agency

B. Polyethylene Tubing (PE) - PE tubing shall be in accordance with AWWA C901 and correspond to copper tubing size (CTS). Pipe shall be furnished in continuous lengths as to avoid unnecessary fittings and multiple pieces. PE tubing can only be used with approval from the Engineer only. The use of PE will be determined on a case by case basis only. The tubing shall be marked with the following:

- Nominal size
- Material code; i.e., PE 4710
- The word "Tubing" and dimension ratio (DR-9) minimum
- AWWA pressure class; i.e., PC 200
- AWWA designation AWWA C901
- Manufacturer's name or trademark
- Seal of testing agency

The polyethylene material shall be type "4710" conforming to ASTM D3350 and ASTM D2737. The pressure class shall be a minimum of 200 psi. Stainless steel liners or inserts shall be used with PE tubing when compression type connections are specified or shown.

- C. Fittings - Fittings including PE couplings, bends, unions, nipples, and adapters shall be constructed of brass or bronze. PVC fittings include adapters, couplings, and bends shall be schedule 80 PVC.

3.0 EXECUTION

3.1 General:

- A. Installation of all in-tract pipelines shall conform to the latest UPC and county plumbing code requirements. Contractor shall notify property owner a minimum of 48 hours prior to entering private property.
- B. The Contractor shall provide a qualified representative to approach landowners with District personnel to discuss meter location. Meeting shall take place a minimum of 48 hours prior to commencing work.
- C. Water meter location shall be selected based on the following:
- Option 1 Reconnect from the new meter location to a hose bib on the front or side of the house facing the nearest new water main. Option 1 cannot be used if any of the following apply: the house is plumbed with a water softener or instant hot water heater, or field conditions are not practical.
- Option 2 Reconnect to the existing service location in the back yard or side yard.

3.2 Locating Existing Services:

The Contractor shall be responsible for excavating to expose the existing service line to make the tie-in and abandonment. The Contractor shall locate the service lines at their cost.

3.2 Service Connections:

- A. Pipe and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure to sunlight for prolonged periods. Pipe and fittings shall be kept clean and free from dirt, dust, debris, and deleterious material. The manufacturer's recommendations regarding storage should be followed. Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the pipe.

- B. Diameters of new in-tract service lines shall be determined according to the size of the service and the length of the new line to be installed. Length shall be measured from the water meter box to the point of connection at the existing water service line or hose bib. Water service lines are to be sized as follows:

| Length Of In-Tract Service Line (FT) | Diameter Of In-Tract Service Line | | |
|--------------------------------------|-----------------------------------|-------------------|-----------------|
| | 1" Service (IN) | 1.5" Service (IN) | 2" Service (IN) |
| <100 | 2 | 2.5 | 2.5 |
| 100-150 | 2 | 2.5 | 3 |
| 151-200 | 2 | 2.5 | 3 |
| 201-300 | 2.5 | 3 | 3 |
| 301-400 | 2.5 | 3 | 4 |

END OF SECTION

DISINFECTING WATER MAINS

1.0 GENERAL

1.1 Scope - All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. In compliance with the California Code of Regulations, Title 22, only certified Distribution Operators are allowed to make decisions addressing the following:

1. Install, tap, re-line, disinfect, test and connect water mains and appurtenances.
2. Shutdown, repair, disinfect and test broken water mains.
3. Oversee the flushing, cleaning, and pigging of existing water mains.
4. Pull, reset, rehabilitate, disinfect and test domestic water wells.
5. Drain, clean, disinfect, and maintain distribution reservoirs

The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities. The pipeline must be hydrostatically tested, per the District's Standard Specification 33 13 10 prior to disinfection except as modified below:

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, pressure regulator, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines

(eligible for final testing) shall be accepted as passing until all underground construction that may disturb the waterline is completed.

1.2 Procedure – All waterlines shall follow the procedure outlined below:

- A. Prevent contaminating materials from entering the water main during storage, construction, or repair. All materials that are stored shall have covered ends prior to being installed. All pipelines shall be swabbed to remove any debris that may have come into contact with the pipe during transportation. The swab shall be a dry or damp cloth, and shall not under any circumstances be saturated with a chlorine mix. The purpose for the swab is solely to remove debris and is in no way a form of disinfection.
- B. Fill the new waterline slowly to remove all air pockets followed by flushing at a minimum of 3 feet per second or an approved velocity or volume to remove any material that may have entered the water main during construction.
- C. Pressure test the new waterline to the District's Standard Specification 33 13 10 and conforming (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22. Testing shall not commence until the water main and all appurtenances have been completely installed and are set to final grade. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.
- D. Prior to disinfection, a sampling plan for the bacteria and standard heterotrophic plate count (HPC) must be created by a licensed Distribution Operator and submitted to District staff for review. The samples can be collected at the approved representative locations.
- E. The new pipeline shall be chlorinated utilizing a District approved method only. After chlorination residuals have been verified the super-chlorinated water shall be flushed from the main following all District procedures.
- F. After the new pipeline has been qualified by District staff, the Contractor can schedule a tie-in to the District's system. The Contractor shall provide a written or e-mail notice to the Engineer a minimum of 5 working days before the proposed scheduled tie-in. District approved tie-in days are Tuesday-Thursday. Requests for exceptions shall be provided to the District for review. The District reserves the right to adjust tie-in days based on system operation.

- 1.3 Submittals - The Contractor shall notify the District a minimum of three business days in advance of its proposed testing schedule for review and concurrence. The Contractor's proposed plans for water conveyance, disinfection, control, and disposal, shall also be submitted in writing.

2.0 MATERIALS

- 2.1 General - All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.

- 2.2 Chlorine - Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution only. Sodium hypochlorite shall be in accordance with requirements of AWWA B300. Sodium hypochlorite shall be certified as suitable for contact with or treatment of drinking water in accordance with NSF 60, Drinking Water Treatment Chemicals-Health Effects. Liquid chlorine shall be used only:

1. Under the direct supervision of a licensed Distribution Operator.
2. When appropriate safety practices are observed.

3.0 EXECUTION

- 3.1 General - The Contractor shall make all necessary provisions for conveying the water from the District designated source to the points of use.

All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline. Disinfection shall be accomplished by chlorination and shall be completed by the Contractor. All chlorinating and testing operations shall be performed in the presence of the District. Per California Title 22, water systems shall utilize only certified Distribution Operators to make decisions addressing the disinfection, testing, and tie-in of new water mains and appurtenances to existing systems.

Disinfection operations shall be scheduled by the Contractor as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities before the work is accepted by the District. A bacteriological test and a standard heterotrophic plate count shall be performed by the District.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by

the Engineer. All dechlorination equipment shall be capable of handling high flows with high levels of chlorine as required for adequate flushing of the new pipeline. The Contractor shall provide all documentation for acceptable reagents that will be used during the dechlorination process for review a minimum of 4 days prior. Discharges of highly chlorinated water that can make it to waters of the state or waters of the US are not allowed. Chlorinated water may only be discharged from a sampling apparatus (service line sample point, blow off sample point, fire hydrant sample point, air release valve sample point, etc.) of less than five gallons during disinfection verification only as approved by the licensed Distribution Operator.

3.2 Disinfecting - After completion of pressure testing operations, the Contractor shall flush and then sterilize all water mains, services, and appurtenances. All sterilization shall follow the procedures as described in AWWA C651. The following exceptions shall be incorporated into the testing procedure as outlined below:

- A. Flushing – Where flow rates are not possible, flushing at the maximum expected flow rate for the pipeline for 4 volumes can be approved by the Engineer.
- B. Disinfection Methods - Disinfection shall only consist of the continuous feed method or the slug method. No tablet or granule methods are allowed for disinfection of District waterlines.
- C. Filling and Contact - Potable water shall be supplied from a temporary backflow connection to the existing system. The Contractor has two options when connecting to fill the new pipeline. Option one the Contractor can check out a District owned temporary water use meter and backflow device that will be tested and placed into service by the District. Option two the Contractor can provide a backflow for the temporary connection to be tested by District staff before the device can be placed into service. Precautions shall be taken to assure that air pockets are eliminated.

All appurtenances shall be sampled for both methods to verify that adequate disinfection has been met. This testing includes all verifications for the 3 hour or 24 hour chlorination procedures. These samples include but are not limited to all service lines, hydrants, blow offs, and air releases. Sampling small diameter lines including services and air releases shall be completed within 10-15 seconds under a pencil sized flow. The service shall not be flushed as to take a sample from the main, but rather verify that the service line is completely disinfected. Fire hydrants and blow offs

shall be sampled within 20 seconds of initializing a low flow. All water discharged shall be adequately de-chlorinated or control land applied as to not have any run off. Control land applies to less than five gallons at one location during testing verification only.

- D. Final Flushing - Per the District's statewide National Pollutant Discharge Elimination System (NPDES) permit, no super-chlorinated water shall be discharged without proper notification and an appropriate neutralizing agent. The environment to which the chlorinated water is to be discharged shall be inspected then a reducing agent shall be applied to the water to be wasted to thoroughly neutralize the chlorine residual remaining in the water. The NPDES permit requires that the District notification for planned large discharges be submitted a minimum of 72 hours prior. The Contractor is required to provide the District a minimum of 4 days notification for any planned large water discharges. For any development projects related to final flushing all work shall be completed under the project specific NPDES permit. The Contractor is made aware to refer to the project specific NPDES permit prior to commencing flushing activities.

- E. Bacteriological Tests – An HPC shall be collected. If the HPC is significantly higher than the District's background then the Contractor will be required to flush the new pipeline again, or re-disinfect, and re-sample. The determination of the extent of the flush or re-chlorination shall be determined by licensed District staff based on the sample results.

Should any of the samples fail to meet minimum State of California, Department of Public Health requirements, the Contractor shall continue to chlorinate and flush the system, as directed, until a satisfactory sample is obtained. The Contractor is responsible for all costs associated with additional flushing and/or re-chlorination of the new pipeline.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is well advised to also sample water entering the new main.

END OF SECTION

WATER PIPING SYSTEM TESTING

1.0 GENERAL

- 1.1 Scope - All completed waterlines, as well as the service assemblies and appurtenant structures, shall be tested by the Contractor in the inspector's presence prior to field acceptance of the work. The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Unless otherwise stated in this standard, all material utilized in the installation of new water mains shall comply with the California Waterworks Standard as currently amended and meet all AWWA standards that are hereby incorporated by reference.

Testing shall be done after the complete installation and compaction of all underground utilities, except as modified below:

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, pressure regulator, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs. All equipment required for testing purposes that comes into contact with drinking water must be NSF 61 approved. All chemicals used for the construction, testing and disinfection of water mains shall be NSF/ANSI 60 approved.

When lines to be tested are in areas that will be paved, testing shall be done after subgrade is placed and compacted. At Engineer's discretion, testing may be performed after subgrade has been accepted. No lines eligible for final testing shall be accepted as passing until all underground construction that may disturb the waterline is compacted.

Pressure testing the new waterline shall conform (at a minimum) to the applicable AWWA standard for the pipe material being installed as required by the California Code of Regulations, Title 22. Testing shall not commence until the water main and all appurtenances have been completely installed. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.

District Standard Specification 33 13 00, Disinfecting Water Mains, covers the disinfection process. All pressure pipelines shall be hydrostatically tested prior to introducing chlorine to the new pipeline.

2.0 MATERIALS

- 2.1 General - All test equipment, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.
- 2.2 Hydrostatic Testing Equipment - The Contractor shall be responsible for supplying and operating all testing equipment. In general, the testing equipment configuration shall consist of a pump receiving water from a calibrated storage tank. The pump discharge shall enter the water main through a tap or appurtenance. A pressure sustaining valve shall be placed on a tee located in the pump discharge line. Discharge from the pressure sustaining valve shall return to the calibrated storage tank. Other types or configurations of testing equipment shall be subject to District approval. The pressure pump shall operate continuous throughout the testing period. If the pump is stopped, the pressure shall not be allowed to drop more than two psi below test pressure before starting the pump.

3.0 EXECUTION

- 3.1 General - The Contractor shall make all necessary provisions for conveying the water from the District designated source to the points of use at the Contractor's own cost.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer.

- 3.2 Hydrostatic Testing - The purpose of the hydrostatic test is both to test the ability of the pipeline to withstand pressure and test for allowable leakage. All hydrostatic testing shall follow the test setup and pressurization procedures as described in AWWA C600, C604, and C605. The following exceptions shall be incorporated into the testing procedure as outlined below:

- A. Preparation - The line shall be filled with water at least 24 hours prior to testing when the pipeline has a mortar lining, thus allowing the lining material to become saturated. Water for testing shall be introduced at the low end of the section being tested to facilitate the elimination of air in the pipeline prior to testing. All pressure gauges used for determining hydrostatic testing shall be liquid filled and shall be capable of operating above the prescribed line test pressure. Gauges shall provide adequate visible ranges to allow accurate measurement for allowable leakage calculation. The

Engineer reserves the right to reject provided gauge that does not meet this specification.

- B. Test Section Length - The length of pipe being tested at any one time shall not exceed 2,000 linear feet unless otherwise approved by the District.
- C. Test Pressure – The test pressure shall be 200 PSI or as outlined in C600, C604, or C605, whichever is greater, measured at the lowest point of the section of the pressure zone being tested.
- D. Test Duration - Pressure in the water main shall be maintained within two psi of the calculated test pressure for a minimum of 2 hours.
- E. Allowable Leakage - The allowable leakage per test section shall be calculated from the formula contained in this subsection. Different sized water mains that might be contained within the same test section shall be calculated separately and then added together.

$$L = \left(SD \frac{\sqrt{P}}{148,000} \right) \times 2$$

WHERE:

L = Testing allowance in Gallons (For a 2 Hour Test).

S = Length of pipeline tested in Feet.

D = Nominal diameter in Inches.

P = Average test pressure during the hydrostatic test in PSI.

- F. Repairs - During the pressure and leakage test, all accessible appurtenances shall be inspected for visual signs of leakage. All visual leaks shall be corrected immediately, regardless of the amount of leakage, and the test shall be run again for its full duration. All leaks detected shall be repaired to a water tight condition. All repairs made shall be retested in accordance with the specifications. All repairs shall be made and a successful test accomplished prior to taking base bacteriological samples for the Disinfection Process.

END OF SECTION

DUCTILE IRON PIPE AND FITTINGS
(GRAVITY SEWER FLOW)

1.0 GENERAL

- 1.1 Scope - This specification governs the furnishing and installation of ductile iron pipe material, including laying, joining, bedding and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract.

The contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.

All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him, and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

The contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe shall be kept free from dirt and foreign matter at all times.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

- 1.2 Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:
- Pipe and joint material

2.0 MATERIALS

- 2.1 Ductile Iron Pipe (DI) - Ductile iron pipe shall conform to the quality and strength requirements of AWWA C-151.

- A. Markings - Each standard or random length of pipe shall be clearly marked with the following:
- The letters "DI" or "Ductile"
 - Nominal size and class
 - Year produced
 - Manufacturer's trade name and country where cast
 - Seal (mark) of testing agency
- B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 350.
- C. Laying Length - Standard laying lengths of 18 or 20 feet are acceptable.
- D. Joint Type - Unless otherwise shown or specified, pipe joints shall be rubber gasket push-on type joint conforming to AWWA C-111.
- E. Physical Test Requirements - Hydrostatic, tension test, and impact test shall be conducted at the factory in accordance with ASTM A746. All testing shall be performed by a recognized testing laboratory with such testing available for inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.
- F. Lining and Coating - Lining and Coating shall be as specified on the plans or Special Conditions.
- G. Polyethylene Encasement - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to with AWWA C-105 latest revision. Minimum thickness shall be 0.008 inch (8 mils).
- H. Warning Tape - Two-inch-wide green non-metallic tape marked "sewerline" shall be used.

3.0 EXECUTION

- 3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

- A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

3.2 Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

- A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Ground water shall not be allowed to enter the pipe.

- B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.

- C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the contractor for the safe and convenient performance of the work. Under no circumstances shall sewer main materials be dropped or dumped into the trench.

If damage occurs to any pipe or accessories in handling, the damage shall be immediately brought to the District's attention.

- D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District's Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

- E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for inserting valves, fittings, or closure pieces, shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

- F. Allowable Deflection - The maximum allowable angular deflection at the joints shall be 80% of manufacturer's recommendation for push-on and mechanical joints. Changes in direction greater than the allowable deflection shall be accomplished with manholes.

- 3.3 Polyethylene Encasement - The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding materials, but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, etc., on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with a minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape.

For installations below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible with adhesive tape at the joint overlap.

Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C-105, Method A. The following summarizes this method.

- A. Installation of Polyethylene Encasement for Pipe - Cut polyethylene tube to a length approximately two feet longer than the pipe section. Slip the tube around the pipe, centering it to provide a one-foot overlap on each adjacent pipe section, and bunching it accordion-fashion lengthwise until it clears the pipe ends.

Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube.

After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.

Any cuts, tears, punctures, or other damage to the polyethylene, shall be repaired as described below. Proceed with installation of the next section of pipe in the same manner.

- B. Installation of Polyethylene Encasement for Appurtenances - Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube, the items shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.

- C. Repairs of Polyethylene Encasement - Repair any cuts, tears, punctures, or damage to polyethylene with adhesive tape, or with a short length of polyethylene sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.

- 3.4 Testing and Disinfection - Testing and disinfection shall be performed on all pipelines, in accordance with Section 33 01 30.13.

END OF SECTION

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS
(GRAVITY SEWER FLOW)

1.0 GENERAL

- 1.1 Scope - This Section of the specifications will govern the furnishing and installation of PVC pipe material and fittings; including laying, jointing, bedding, testing and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be done in strict accordance with the drawings and other terms and conditions of the contract.

The contractor shall also furnish all equipment, tools, labor and materials required to rearrange sewers, conduits, ducts, pipes, or other structures as may be necessary to provide installation as shown and specified.

All standard specifications, i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The contractor shall be responsible for all material furnished by him and shall replace it at his own expense, should the material be defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

- 1.2 Storage and Care - The contractor shall be responsible for the safe storage of material furnished by or to him and accepted by him, and intended for the work, until it has been incorporated in the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

1.3 Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

2.0 MATERIALS

2.1 Polyvinyl Chloride Pipe (PVC) and Fittings - PVC pipe and fittings shall be made in accordance to ASTM D-3034 or ASTM F679, and ASTM D1784 in both physical, dimensional and chemical requirements. Pipe shall be green unless otherwise approved.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:

- Manufacturer's name
- Nominal pipe size, i.e. six-inch
- Cell classification or material code; i.e. 12454-B
- Dimension ratio; i.e. SDR35
- Product type; i.e. Type PSM
- Standard specification designation; i.e. 03034
- Production code

B. Pipe Class - The SDR or wall thickness shall be as shown on the plans.

C. Laying Length - The standard laying length shall be 20 feet (plus/minus) 1 inch. A maximum of 15% may be furnished in random lengths of not less than 10 feet each.

D. Joint Type - Pipe joints shall be constructed with an integral bell and spigot with an elastomeric gasket push-on-type joint. Each spigot shall have a reference mark to facilitate pipe assembly. The gasket shall be contained in a machined groove on the pipe spigot such that when compressed the gasket will not displace and will form a positive seal. The gasket shall meet all requirements of ASTM F-477; pipe lubricant shall be listed with NSF (National Sanitation Foundation).

Solvent cement joints are strictly prohibited.

E. Physical Test Requirements -

1. Material - Material samples shall be taken at the beginning of production and tested for compliance to ASTM D-3034 or ASTM F794.
2. Product Quality - The following tests shall be performed on a sample of pipe.

Flattening - Three specimens of pipe per pipe size furnished, minimum of six inches long, shall be flattened between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within two to five minutes. Remove the load, and examine the specimens for splitting, cracking, or breaking.

Pipe Stiffness - The pipe stiffness shall be determined utilizing procedures similar to those outlined in ASTM D2412. The stiffness of pipe shall be determined at a 5% deflection datum. Test specimens shall be a minimum of two pipe diameters or four feet in length, whichever is less.

Joint Tightness - Joint tightness shall be tested in accordance with ASTM D3212.

The manufacturer shall provide a certificate of conformance for the above tests. Tests shall be performed on materials and products from the same lot of those furnished to the project.

Plant Inspection - The District may require inspection of production of the pipe. When requested, the manufacturer shall provide advance notice of when and where production of materials will begin.

- F. Struts - All pipe, 24 inches in diameter and greater, shall be strutted prior to placement in the trench. Each strut shall consist of two 2x4's placed in a perpendicular cross. A minimum of four struts equally spaced shall be placed per pipe length. Struts are to be removed prior to backfill above the pipe zone.

2.2 Warning Tape - Warning tape shall be two-inch wide green non-metallic tape marked "sewerline."

2.3 Fittings - All fittings shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with the pipe.

3.0 EXECUTION

3.1 Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

A. Rubber Gasket Storage - Store all rubber gaskets in a cool, well ventilated place and do not expose to the direct rays of the sun. Do not allow contact with oils, fuels, petroleum, or solvents.

3.2 Pipe Laying -

A. General - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

B. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Groundwater shall not be allowed to enter the pipe.

C. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.

- D. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the contractor, for the safe and convenient performance of the work. All pipe shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the materials. Under no circumstances shall the pipe be dropped or dumped into the trench.

If damage occurs to any pipe or accessories in handling, the damage shall be immediately brought to the District's attention.

- E. Laying of Pipe - Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow. After a section of pipe has been lowered into the prepared trench, the contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. The assembly of the joint shall be made in accordance with the recommendations of the manufacturer of the type of joint used. The bell and spigot joint shall be pushed "home" in line with the installation band. If a piece has been cut, the usable end shall be clearly marked to show the proper amount of installation distance. All special tools and appliances required for jointing assembly shall be provided by the contractor.

After the joint has been made, the contractor shall check pipe for alignment and grade. The trench bottom shall form a continuous and uniform bearing and support along the length of the pipe between joints. Sufficient pressure in making the joint shall be applied to assure proper pipe alignment and joint makeup. Sufficient pipe zone material shall be placed to secure the pipe and prevent movement before the next joint is installed.

When pipe is laid within a movable trench shield, all necessary precautions shall be taken to prevent pipe joints from pulling apart when moving the shield ahead.

Precautions shall be taken to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, or whenever the workers are absent from the job, the contractor shall close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

Pipes which are stubbed off for manhole construction or for connection by others shall be plugged or closed off with temporary plugs as specified in the manhole specifications.

The contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

Where pipe is connected to manholes or concrete structures without using a flexible connector, connections shall be made so that the standard pipe joint is located not more than 2 feet from the outside edge of the structure unless otherwise shown.

- F. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory finished beveled end shall be used as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using manufacturer recommendations. Sharp edges on the leading edge of the bevel shall be rounded off with a pocket knife or a file.

END OF SECTION

MANHOLES

1.0 GENERAL

- 1.1 Scope - The work covered by this section shall consist of furnishing all materials, accessories, equipment, tools, transportation, service, labor and performing all operations to furnish and install concrete manholes in accordance with this section of the specifications and applicable drawings. Testing of manholes shall be done in accordance with Section 33 01 30.13.

Precast concrete bases, wall sections, and covers shall be manufactured in a facility especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

- 1.2 Submittals - Prior to installation, the following information is to be submitted:
- A. Manufacturer's catalog data on precast items. Show dimensions, reinforcing thickness of walls, and top slab shall be shown. Show materials of construction by ASTM reference and grade.
 - B. Concrete mix design and reinforcing for cast-in-place concrete item.
- 1.3 Design Loads - Design loads shall consist of dead load, live load, impact, and, in addition, loads due to water table and any other loads which may be imposed upon the manhole.

2.0 MATERIALS

- 2.1 Concrete - Portland cement concrete shall conform to Class A as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete."
- 2.2 Reinforcement - Reinforcement shall be deformed reinforcement in accordance with ASTM A615 or ASTM A497 for welded deformed wire fabric.
- 2.3 Base Rock - Base Rock shall be 3/4-inch aggregate base conforming to Caltrans Specifications for Class 2 aggregate base.
- 2.4 Precast Manhole Wall Sections - Precast manhole sections shall be of the size indicated on the Drawings. The contractor shall provide the District with a Certificate of Compliance from the manhole manufacturer that the

manholes and concrete mix conform in all respects to these specifications and requirements of ASTM C478. Minimum wall thickness shall be 4 inches. Cones shall have the same wall thickness and reinforcement as manhole section. The top and bottom of all sections shall be parallel.

Joints shall be tongue-and-groove type.

- 2.5 Precast Base Sections and Adaptor Ring - Unless otherwise approved, all concrete manhole bases shall be precast. Connections to the base shall be made with elastomeric boots or an approved cast-in adaptor.
- 2.6 Manhole Extensions - Concrete grade rings for extensions shall be a maximum of six-inches high and shall be approved by the District before installation.
- 2.7 Mortar - Standard premixed mortar conforming to ASTM C387 or proportion 1 part Portland cement with 2 parts clean, well graded sand which will pass a 1/8-inch screen. Admixtures may be used provided they do not exceed the following percentages by weight of cement: Hydrated lime, 10%; diatomaceous earth or other inert materials, 5%. Consistency of mortar shall be such that it will readily adhere to the applied surface. Mortar mixed for longer than 30 minutes shall not be used.
- 2.8 Preformed Plastic Gaskets - Preformed plastic gaskets shall be used for the manhole assembly and shall be Kent-Seal No. 2 manufactured by Hamilton Kent Manufacturing Company, Box 178, Kent, OH 44240; Ram-Nek, manufactured by K.T. Snyder Company, Inc., Central National Bank Bldg., Houston, TX 77002; or equal, meeting all requirements of Federal Specifications SS-S00210.
- 2.9 Manhole Frames and Covers - Covers shall have the word SEWER in raised two-inch letters. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A48, Class 30B. All bearing surfaces shall be machined to ensure true flat surfaces. Covers shall be true and seat within the ring at all points. Frames shall be water tight and be of the grooved gasketed type. Manhole frames and covers shall be as shown on the approved Materials List.
- 2.10 Backfill Material - Backfill material shall conform to Section 31 23 16. When material from the excavation is unsuitable for use in backfill, it shall be disposed of and suitable material, which is capable of attaining the required relative compaction, shall be arranged for and furnished.

3.0 EXECUTION

- 3.1 Excavation - The contractor shall prepare an excavation large enough to accommodate the structure and permit grouting of openings and backfilling operations. Excavations shall be made in accordance to Section 31 23 16. No earth backfill will be permitted to correct overdepth excavation. Over excavation shall be corrected as described in Section 31 23 16-3.2.
- 3.2 Precast Bases - Precast bases shall be placed on six-inches of pipe bedding material compacted to 95% and graded level. The top of the base, when installed, shall be level in all directions.
- 3.3 Cast-in-Place Bases - Manhole base shall be poured in accordance to the standard drawing against undisturbed soil. All vertical surfaces shall be poured against approved forms. The base shall extend to the lines shown on the details.

The manhole stubs and sewer main shall be set before the concrete is placed and shall be rechecked for alignment and grade before the concrete has set. The various sized inlets and outlets to the manhole shall be located as indicated on the plans and as detailed in the detail drawings. Invert elevations of connecting sewers may vary.

The invert of the manhole base shall be hand worked so as to provide channels conforming in size and shape to the lower portions of the inlets and outlets. The manhole invert channels shall be smooth and accurately shaped. Channels may be formed directly in the concrete base.

All transitions shall be smooth and of the proper radius to give an uninterrupted transition of flow.

The concrete base shall be shaped with a wood float and shall receive a hard steel trowel finish before the concrete sets.

In the event additional mortar is required after initial set has taken place, the surface to receive the mortar shall be primed, and the mortar mixed with a concrete adhesive in the amounts and proportions recommended by the manufacturer and as directed by the District in order to secure as chip-proof a result as possible.

The bases shall set a minimum of 24 hours before manhole construction is continued. In certain critical situations, the time of setting may be reduced upon approval of the District.

- 3.4 Manhole Assembly - Manhole assembly shall be as shown on the standard drawings. Each precast concrete unit shall be set plumb using preformed plastic gaskets at all joints.

It is the intent of these specifications that manholes and appurtenances be watertight and free from infiltrations. Manholes shall be free of any seeping or surface moisture prior to the application of a protective lining or coating. Adequate watertightness of manholes and appurtenances shall be determined by the District upon completion of testing by the contractor. All stubs shall be plugged with stoppers or brick wall plugs as shown on the plans for various sizes of pipe.

In order to prevent accidental use of the new sewer before completion and acceptance, the inlet to existing tie-in manholes shall be sealed. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final inspection or as directed by the District.

- 3.5 New Connections to Existing Manholes - New connections to existing manholes, where stubs have not been provided, shall be made by core drilling through the wall and rebuilding the manhole bench as shown on the standard drawings.
- 3.6 Backfill - Backfill around manholes shall be placed and compacted in accordance to Section 31 23 16.

END OF SECTION

RECYCLED WATER SYSTEMS

1.0 GENERAL

- 1.1 Scope - This section governs the materials and installation of pipelines and fittings for recycled water systems. All components of recycled water systems shall conform to the specifications of the potable water system except as specified in this section.

2.0 MATERIALS

- 2.1 PVC Pipe - PVC recycled water piping shall be purple-colored. The pipe shall be identified as recycled water pipe by continuous marking. The markings shall include the following: CAUTION RECYCLED WATER - DO NOT DRINK. Nominal pipe size. PVC-1120. Pressure rating in pounds per square inch at 73 degrees Fahrenheit. ASTM designations such as 1785, 2241, 2672, 3139. Printing shall be placed continuous on two sides of the pipe.
- 2.2 Ductile Iron Pipe - Ductile iron pipe shall conform to Section 33 11 13.13 and shall be encased with purple plastic sleeve.
- 2.3 Plastic Wrap or Sleeve - The plastic warning wrap or sleeve shall be prepared with black printing on a purple field having the words, "CAUTION: RECYCLED WATER DO NOT DRINK".
- 2.4 Quick-coupling Valves - Quick-coupling valves shall be constructed of brass with a purple rubber or vinyl cover, and shall have a $\frac{3}{4}$ - or 1-inch inlet.
- 2.5 Valve Boxes
1. All gate valves, manual control valves, electrical control valves, pressure reducing valves for on-site recycled water systems shall be installed below grade in a valve box.
 2. Valve boxes should be the standard round-type concrete box with a special triangular, heavy-duty cover. All valve covers on the off-site nonpotable waterlines should be of non-interchangeable shape with potable water covers and with the recognition inscribed "Recycled Water" cast on the top surface.

2.6 Tags

Tags shall be weatherproof plastic, 3" x 4", purple in color with the words "WARNING RECYCLED WATER DO NOT DRINK". Imprinting shall be permanent and black in color. Use tags as manufactured by T. Christy Enterprises or approved equal.

2.7 Service Pipe - Service pipe shall be PE tubing per Technical Specification 33 12 13 encased in purple plastic sleeve.

3.0 EXECUTION

3.1 General - All buried PVC pipe in the recycled water system shall be purple colored with stenciling identifying it as recycled water in accordance with the AWWA Guidelines for the Distribution of Non-potable Water. Ductile iron pipe shall be wrapped with purple plastic wrap.

Standard PVC pipe completely wrapped with purple plastic wrap, as specified below, may be accepted as an alternative to stenciled purple colored PVC pipe only on a project-by-project basis with prior written approval from the District Engineer. The color of the wrap must be in accordance with the AWWA Guidelines for the Distribution of Non-potable Water.

Plastic Wrap shall be installed completely around the pipe. Plastic wrap shall be installed continuous for the entire length of the pipe and shall be fastened to each pipe length by plastic banded around the pipe with fasteners no more than five feet apart. Taping attached to the sections of pipe before laying in the trench shall have flaps sufficient for continuous coverage.

The District may require tags, as approved by the District, to be installed on designated facilities such as on valves and blowoffs. The tags will notify that the system contains recycled water that is unsafe to drink.

All recycled water facilities are to be clearly identified differently from potable water by being tagged or painted purple.

END OF SECTION

GATE VALVES

1.0 GENERAL

1.1 Scope - This specification governs materials and installation of gate valves. Valves shall be furnished and installed by the contractor at the locations shown on the approved plans, or as required by the District.

1.2 Submittals - Prior to the purchase of gate valves to be used in the District's system, the following items shall be submitted and approved by the District:

- Manufacturer's catalog data and detail construction sheets showing the size to be used, valve dimensions, pressure rating, and materials of construction.
- Manufacturer's catalog data and NSF certification seal on the lining to be used.

2.0 MATERIALS

2.1 Gate Valves three inches and Larger - Gate valves three inches and larger, shall be resilient-seated suitable for buried service and meet the requirements of AWWA C-509, manually operated. All such valves shall be of the non-rising stem type, with double o-ring seal and shall turn to the left in a counter-clockwise direction to open the valve.

All valves shall be suitable for frequent operation as well as service involving long periods of inactivity. Valves shall be capable of operating satisfactorily with flows in either direction and shall provide zero leakage past the seat.

A. Valve Body - Body, bonnet, operating nut, and stuffing box shall be of iron with internal working parts of solid bronze. Exposed capscrews, bolts and nuts shall be stainless steel type 304.

The word "open" and an arrow indicating the direction to open shall be cast on each valve body or operator.

B. Valve Operator - Valve operators shall be equipped with a two-inch AWWA square operating nut. They shall be sealed and gasketed and lubricated for underground service. The operator shall be capable of withstanding an input torque of 450 ft. lbs. at extreme operator position without damage.

- C. Coating and Lining - Interior surfaces, excluding seating areas, bronze, and stainless steel pieces, shall be epoxy lined to a dry film thickness of 12 mils.

Liquid epoxy linings shall be applied in two coats. Liquid epoxy coating materials shall be listed in the NSF Listing for Drinking Water Additives, Standard 61, as certified for use in contact with potable water. Powder epoxy coating materials shall contain 100% solids. Surface preparation shall include White Metal Blast Cleaning.

Exterior surfaces shall be shop coated with two coats of asphalt varnish conforming to AWWA C-509. Flange faces shall be coated with a rust preventive compound.

- D. Marking - The manufacturer shall show on the valve the size, manufacturer, class and year.
- E. Gate - Gate shall be cast or ductile iron encapsulated in Buna-N rubber or nitrile elastomer.
- F. Types of End Connection - End connections may be either flanged, push-on, or mechanical joint type per Section 33 11 13.13 or Section 33 11 13.23.

2.2 Gate Valves three Inches and Smaller -

- A. Aboveground Valves - Aboveground threaded end gate valves, 1/4-inch through 3 inches for water service, shall be nonrising stem, screwed bonnet, solid wedge disc type having a minimum working pressure of 220 psi. The body, bonnet, and stem shall be of bronze, ASTM B 62. Handwheels shall be of brass. Packing shall be Teflon asbestos.
- B. Buried Valves - Buried gate valves for water service shall be iron body, bronze mounted, nonrising stem type, double disc, parallel seat, and shall have a working pressure of at least 200 psi.

Valves shall have flanged or threaded ends to match the pipe ends. Valves supplied with threaded ends shall not be in direct contact with the soil.

Valves shall have a two-inch AWWA operating nut.

Bonnet and stuffing box bolts shall be cadmium plated steel. Discs, disc nut, disc ring, and seat ring shall be bronze.

3.0 EXECUTION

3.1 Storage - Valves shall be delivered and stored in the field with the port openings covered with plastic, cardboard or wood. These covers shall remain in place until the valve is ready to be installed. Valves shall not be stored in contact with bare ground. Valves shall not be stacked on top of one another.

3.2 Installation - The weight of the valve shall be supported by firm ground or concrete blocking and not by the pipe. Buried valves having the top of the operating nut greater than three feet below the finished surface shall be provided with shaft extensions.

A. Flanged Connection - Boltholes of flanged valves shall straddle the horizontal and vertical axis of the pipe to which the valves are attached. Flanges, bolts and nuts shall be cleaned by wire brushing before installing flanged valves. Threads on nuts and bolts shall be lubricated with oil and graphite. Nuts and bolts shall be tightened uniformly and progressively. If flanges leak under pressure testing, the contractor shall loosen or remove the nuts and bolts, reseal or replace the gasket, reinstall or retighten the bolts, and retest the joints. Joints shall be watertight.

Bolts shall be tightened in an even manner by a series of steps until the torque required by the manufacturer is reached.

B. Threaded Connection - Threaded joints shall be cleaned by wire brushing or swabbing. Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

C. Push-on Connection - Rubber ring grooves of joints shall be inspected before installation by the contractor for ridges or holes that would interfere with the rubber ring. Interferences with the rubber rings shall be corrected to a satisfactory condition or the valve replaced, as required by the District.

The pipe to be stabbed into the valve shall be beveled. Pipe shall be stabbed into the valve to the "Insertion Depth" as specified by the manufacturer.

D. Mechanical Joint - Valve socket, gland, and pipe plain end shall be wiped clean of all sand, dirt and other foreign material prior to valve installation. Bolts shall be tightened in a manner by a series of steps until the torque required by the manufacturer is reached.

- E. Polyethylene Encasement - Valves and all bolted connections shall be encased with 10 mil polyethylene plastic film wrap installed as follows: The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with two-inch strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with a plastic adhesive tape on either side of the valve, flange or fitting.

- F. Operation - Immediately before installation, each valve shall be operated through one complete open-close cycle and visually checked for proper operation. Boxing of valves shall begin immediately after pipe sections containing the valve have been installed. All valve boxes, paving rings, and lids shall be brought to grade after pavement has been constructed.

END OF SECTION

BUTTERFLY VALVES

1.0 GENERAL

- 1.1 Scope - This specification governs materials and installation of butterfly valves. Valves greater than 12 inches shall be butterfly valves.

Valves shall be furnished and installed by the contractor at the locations shown on the approved plans, or as required by the District.

- 1.2 Submittals - Prior to the purchase of butterfly valves to be used in the District system, the following items shall be submitted and approved by the District.

- A. Manufacturer's catalog data and detail construction sheets showing the size to be used, valve dimensions, pressure rating and materials of construction.
- B. Actuator manufacturer's catalog data and detail construction sheets showing the dimensions, materials, number of turns, and required torque input of the actuator to be used.
- C. Manufacturer's catalog data and NSF certification seal on the lining to be used.

2.0 MATERIALS

- 2.1 General - Butterfly valves shall be tightly closing, rubber seated valves conforming to AWWA C-504 suitable for buried service. Valves shall be Class 150-B designed for tight shut-off up to 150 psi in both directions. Valve disc shall rotate 90 degrees from fully open to tightly closed position.

- A. Valve body - Valve bodies shall be cast iron with integrally cast mechanical joints or flanged ends. Exposed capscrews, bolts, and nuts shall be stainless steel type 304.
- B. Valve operators - Shall be of the manual traveling nut type. Operators shall be equipped with a two-inch AWWA square operating nut. They shall be sealed and gasketed and lubricated for underground service. The operator shall be capable of withstanding an input torque of 450 ft. lbs. at extreme operator position without damage.

Gear operators for valves located above ground or in vaults and structures shall have handwheels. The handwheel shall have a minimum diameter of 12 inches. The actuator shall contain a dial indicator which shows the position of the valve disc.

- C. Coating and Lining - Interior surfaces, excluding seating areas, bronze, and stainless steel pieces, shall be epoxy lined to a dry film thickness of 12 mils. Liquid epoxy linings shall be applied in two coats. Lining of interior valve surfaces shall be performed in a facility with qualified personnel and where the environment can be controlled. Epoxy lining of valves shall not be permitted in the field. Liquid epoxy coating materials shall be listed in the NSF Listing for Drinking Water Additives, Standard 61, as certified for use in contact with potable water. Powder epoxy coating materials shall contain 100% solids. Surface preparation shall include White Metal Blast Cleaning.

Exterior surfaces shall be shop coated with two coats of asphalt varnish conforming to AWWA C-504. Flange faces shall be coated with a rust preventive compound.

- D. Marking - The manufacturer shall show on the valve the valve size, manufacturer, class and year of manufacture.
- E. Valve Disc and Shaft - Discs shall be cast iron with a stainless steel edge. Shafts shall be type 304 stainless steel.
- F. Types of End Connections - End connections may be either flanged or mechanical joint type per Section 33 11 13.13 or Section 33 11 13.23.

3.0 EXECUTION

- 3.1 Storage - Valves shall be delivered and stored in the field with the port openings covered with plastic, cardboard or wood. These covers shall remain in place until the valves are ready to be installed. Valves shall not be stored in contact with bare ground. Valves shall not be stacked on top of one another.
- 3.2 Installation - The weight of the valve shall be supported by firm ground or blocking and not the pipe.
- A. Flanged Connection - Valves shall be installed with the operating nut in the vertical position. Flanges, bolts and nuts shall be cleaned by wire brushing before installing flanged valves. Threads of bolts and nuts shall be cleaned by wire brushing, and threads shall be

lubricated with oil and graphite. Nuts and bolts shall be tightened uniformly and progressively. If flanges leak under pressure testing, the contractor shall loosen or remove the nuts and bolts, reseal or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

Bolts shall be tightened in an even manner by a series of steps until the torque required by the manufacturer is reached.

- B. Mechanical Joint - Valve socket, gland, and pipe plain end shall be wiped clean of all sand, dirt and foreign material prior to valve installation. Bolts shall be tightened in a manner by a series of steps until the torque required by the manufacturer is reached.
- C. Polyethylene Encasement - Valves and all bolted connections shall be encased with 10 mil polyethylene plastic film wrap installed as follows: The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends around the body to the stem and securing it in place with two-inch strips of adhesive tape. The polyethylene shall be secured around the valve in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with a plastic adhesive tape on either side of the valve flange.
- D. Operation - Immediately before installation, each valve shall be operated through one complete open-close cycle and visually checked for proper operation. Boxing of valves shall begin immediately after pipe sections containing the valves have been installed. All valve boxes, paving rings, and lids shall be brought to grade after pavement has been constructed.

END OF SECTION

TAPPING VALVES AND SLEEVES

1.0 GENERAL

- 1.1 Scope - This section governs materials and installation of tapping valves and sleeves. Valves shall be furnished and installed by the contractor at the locations shown on the Approved Plans, or as required by the District.
- 1.2 Submittals - Prior to the purchase of tapping valves and sleeves to be used in the District system, the following items shall be submitted to and approved by the District:
- A. Manufacturer's catalog data and detail construction sheets showing the size to be used, valve and sleeve dimensions, pressure rating and materials of construction.
 - B. Manufacturer's catalog data and NSF certification seal on the lining to be used.

2.0 MATERIALS

- 2.1 Tapping Valves - Tapping valves shall be of the double disc or resilient seat type conforming to all requirements for gate valves in Section 40 05 61. Valves shall be furnished with a flanged end with centering ring on the tapping sleeve side. The outlet side of valve shall have a mechanical joint, except as otherwise approved. Seat rings shall be oversized to permit the use of full-size cutters.
- 2.2 Tapping Sleeves - Sleeves shall be 304 stainless steel or cast iron conforming to ASTM-A-126 Class B. Bolts, nuts, and washers shall be type 304 stainless steel. Gaskets shall be Buna-N rubber at each end of the sleeve. Sleeves shall have $\frac{3}{4}$ -inch NPT plug for air test.
- 2.3 Coating and Linings - Valves shall be coated and lined per Section 40 05 61. Cast iron sleeves shall be coated with two coats of asphalt varnish conforming to AWWA C504, except for face of flanges, bolts and nuts. Face of flanges shall be shop coated with a rust preventive compound.

3.0 EXECUTION

- 3.1 Installation - Surface preparation, sleeve placement, and connection of valve shall be in accordance with manufacturer's recommendations. Method of installation may vary depending on type of pipe being tapped.

- 3.2 Testing - Valve and sleeve shall be air tested prior to pipe cutting. Valve and sleeve shall sustain an air pressure of 30 psi for 5 minutes. After acceptance of the air test the pipe can be tapped.
- 3.3 Tapping - Tapping shall only be done in the presence of the Inspector. The tapping mechanism shall be of the self-purging type so that cutting chips are removed from the tapping machine and do not enter the pipeline.
- 3.4 Size - The diameter of the tap shall be less than the diameter of the main being tapped.

END OF SECTION

AIR AND VACUUM VALVE ASSEMBLIES

1.0 GENERAL

- 1.1 Scope - This specification governs materials and installation for air release, air and vacuum, or combination air-vacuum and air release valve assemblies. The type of air valve to be installed shall be as indicated on the plans. Valve assemblies include all items from the main pipeline to the valve vent as shown on the Standard Drawings.
- 1.2 Submittals - Prior to the purchase of valves to be used in the District system, the following items shall be submitted and approved by the District:
- A. Manufacturer's catalog data showing valve type and size to be used, valve dimensions, pressure rating, NSF 61 certification, and materials of construction.

2.0 MATERIALS

- 2.1 Valves - Valve bodies shall be of high strength cast iron. The float, seal, and all moving parts shall be of Type 316 stainless steel. Seat washers and gaskets shall be of Buna-N, Nitrile Rubber. All valves shall be NSF 61 approved. Valves shall be designed for a minimum pressure of 150 psi unless otherwise shown on the plans. Valves shall be designed to perform the following function:
- A. Air Release Valve - Air release valves shall be designed to release small amounts of air that can accumulate at high points in systems once they are filled and under pressure.
- B. Air and Vacuum Valves - Air and vacuum valves shall be designed to: (1) expel large amounts of air from a system when it is being filled, (2) remain closed when the system is in operation and under pressure, and (3) open to allow air to enter when the line begins to drain and the internal pressure reverts to atmosphere.
- C. Combination Air-Vacuum and Air Release Valves - These valves combine the features of the air release, and the air and vacuum valves specified herein.
- 2.2 Appurtenances - Materials for gate valves, piping, boxes, and fittings shall conform to the requirements of the Standard Drawings.

3.0 EXECUTION

- 3.1 Installation - The tap for the air valves shall be made in a level section of pipe no closer than 36 inches to a bell, coupling, joint, or fitting.

Tapping mains shall conform to the standard procedures for house services.

Air valve assemblies shall be installed in accordance with the Standard Drawing.

Threaded joints shall be cleaned by wire brushing or swabbing. NSF approved Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

The contractor shall also isolate nonferrous pipe from steel supports and pipe straps by means of insulating sleeves or tape wrapped around the pipe.

- 3.2 Testing - Air valve assemblies shall be tested at the same time that the connecting pipelines are pressure tested and disinfected.

END OF SECTION

FIRE HYDRANT ASSEMBLIES

1.0 GENERAL

1.1 Scope - This specification governs materials and installation for fire hydrant assemblies. Fire hydrant assembly includes all items from the main line tee to the fire hydrant as shown on the Standard Drawings.

1.2 Submittals - Prior to the purchase of fire hydrants to be used in the District's system, the following items shall be submitted and approved by the District:

- Manufacturer's catalog data showing model, size, dimensions, and materials of construction.

2.0 MATERIALS

2.1 Fire Hydrants - Fire hydrants shall be dry barrel type meeting AWWA C502 and have a 6-inch bell inlet with two 2 ½-inch hose outlets and one 4½-inch pumper connection. Threads on the pumper and hose connections shall conform to the requirements of the fire department equipment of the area which they are to serve or if no standards exist, they shall conform to the "National Standard Screw Threads for Fire Hose Couplings and Fittings" published by the National Board of Fire Underwriters. Hydrants shall be designed to operate at a minimum of 250 psi working pressure and shall be tested hydrostatically to 400 psi. Fire hydrants shall open to the left (counterclockwise). The hydrant shall be cast iron and bronze mounted. Hydrants shall have a main valve opening size of 5 ¼ inches. The outlets shall be protected with caps attached to the hydrant head with a chain. Other specific requirements are:

- Hydrant materials shall comply with AWWA C502.
- Hydrant flanges shall contain six equally spaced bolt holes of 7/8-inch diameter on a 9 3/8-inch diameter.
- All hydrants shall be permanently marked with the manufacturer's name and the year of the manufacture.
- Caps shall be metal-type.

2.2 Hydrant Lateral – Laterals under 50-feet shall be 6-inch DI or PVC pipe DR-14, and laterals over 50-feet shall be 8-inch DI or PVC DR-14 pipe. All pipe used for fire hydrant laterals shall be fully restrained. Hydrant laterals shall be pressure rated appropriately. Thrust block sizes shall be as shown in the Standard Drawings.

- 2.3 Hydrant Lateral Valve - The lateral valve shall be a 6-inch gate valve in runs less than 50-feet, and 8-inch valve in runs greater than 50-feet with a reducer to 6-inch pipe at the end of the run to a 6-inch valve for the hydrant. The valve shall be stacked to the surface as shown on the Standard Drawings.
- 2.4 Spools and Bury - Hydrant burys shall be 6-inches inside the diameter and made of cast iron conforming to ASTM A-126. The burys shall be one piece with the top having a flange drilled with six holes to receive the extension spool or hydrant. The bury end shall be flange or mechanical joint fitting. All fire hydrant extensions shall be one piece only and installed in the presence of the Engineer. The Engineer reserves the right to have the extensions removed and re-installed in his presence. If the hydrant bury requires more than one extension the hydrant shall be installed with a vertical shoe only.
- 2.5 Bolts - Alloy steel break-off bolts shall be used to attach the fire hydrant to the extension spool. All break away parts shall be installed at the connection between the hydrant and the extension spool.

3.0 EXECUTION

- 3.1 Examination of Material - Prior to installation, all hydrants shall be inspected for direction of opening, nozzle threading, operating-nut and cap-nut dimensions, tightness of pressure-containing bolting, cleanliness of inlet elbow, handling damage, and cracks. Defective hydrants shall be corrected or held for inspection by the District.
- 3.2 Placement of Hydrant - All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with pumper nozzle facing the curb. In locations where the hydrant is to be closer than 6 feet from the back of the curb, the curb shall be vertical for 6 feet in both directions.
- 3.3 Assembly Installation - Special attention is called to the following:
- The shoe of the fire hydrant bury must be anchored on a concrete thrust block.
 - The fire hydrant shall be positioned so that the bolts between the extension piece and the hydrant are accessible, both top and bottom, within the limits shown on the Standard Drawing. If the hydrant is either too low or too high, it shall be corrected.
 - Painting shall be per Section 09 90 00 with all metal surfaces above ground being painted. Extensions shall have a shop coat and be wrapped in 8-mil polyethylene encasement. Color of hydrant will be determined by the local fire department.

- All underground iron fittings and hydrant bury shall be wrapped with polyethylene.

3.4 Testing – Hydrants shall be tested after the main per AWWA M17. Hydrant foot valves shall be closed during the pressure test of the new main. With completion of the hydrostatic test on the new main the hydrant testing procedure can be completed. The new hydrants shall be pressure test at main normal operating pressure as follows:

- Remove the highest outlet nozzle cap and open the hydrant valve a few turns. Allow water to reach the bottom of the outlet nozzle.
- Replace the outlet nozzle cap and leave it loose to permit all air to escape.
- After all air has escaped, open the hydrant completely.
- Check for leakage at the flanges, outlet nozzles, and the packing around the stem. If leakage is noted, repair or replace the faulty components or the entire hydrant.

Hydrants shall have the drain valves tested in the following manner:

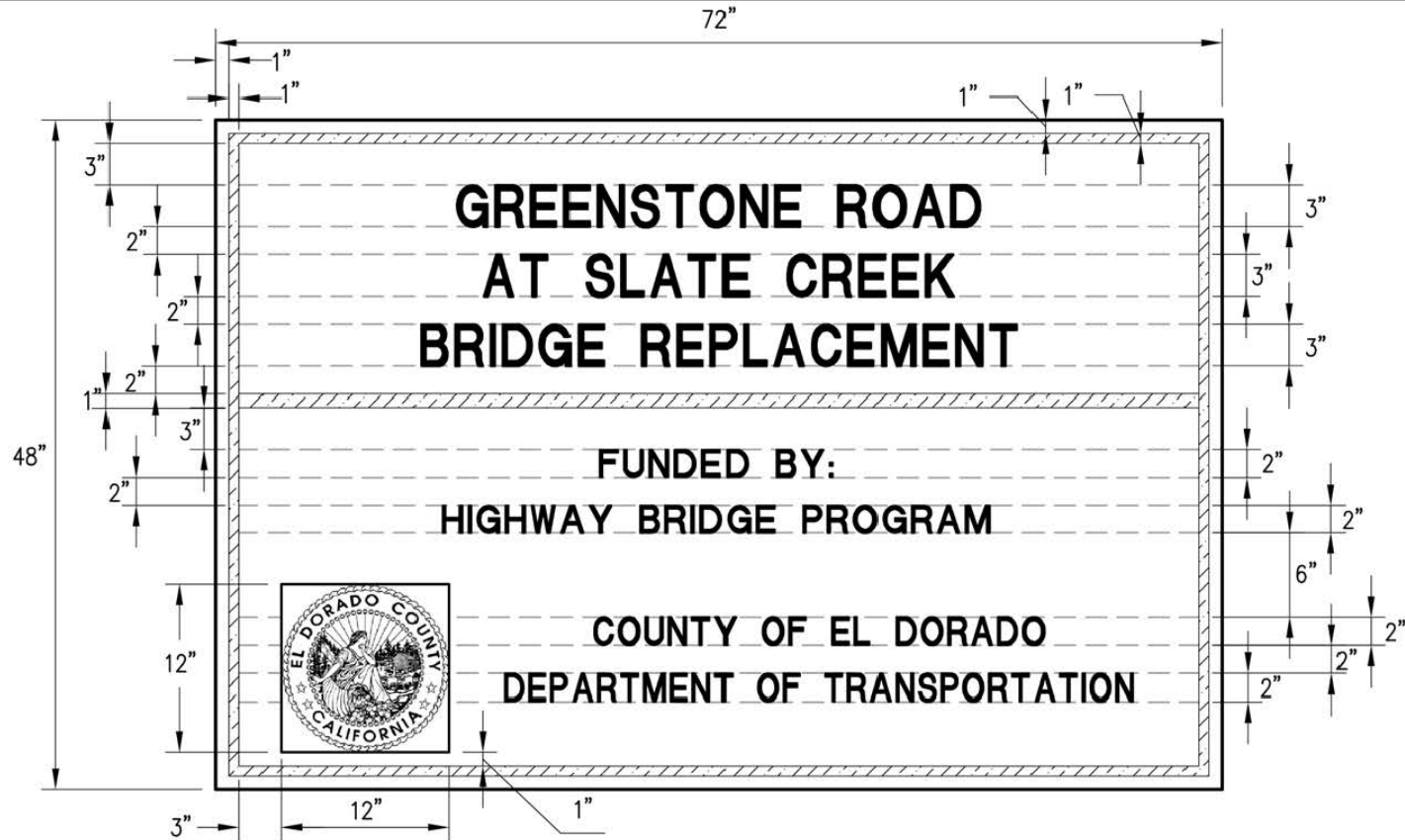
- Following the pressure test, open fire hydrant valve a few turns and allow hydrant to fill until water is at bottom of nozzle. Close hydrant valve and observe water level drop. If drop in water level is not visible, place palm of hand over open nozzle to feel a noticeable suction. If water level drop is not detectable, the hydrant has failed the drainage test.
- If the hydrant fails the drainage test, the drain valve may be clogged or backfill material does not permit free drainage. The contractor shall make the necessary corrections and repairs to correct improper drainage and re-test.

END OF SECTION

APPENDIX D

**To the Contract Documents for
Greenstone Road at Slate Creek Bridge Replacement Project
CIP No. 77137, Contract No. 3605
Federal Aid No. BRLO – 5925(103)**

FUNDING SIGN EXHIBIT



NOTES

1. THE ENGINEER SHALL SUPPLY THE CONTRACTOR WITH THE EL DORADO COUNTY LOGO IN DIGITAL FORMAT. THE IMAGE SHALL BE PRINTED TO THE DIMENSIONS INDICATED, AND PLACED ON THE SIGN IN THE GENERAL LOCATION SHOWN.
2. THE IMAGE OF THE EL DORADO COUNTY LOGO SHALL BE BLACK (NON-REFLECTIVE) ON WHITE BACKGROUND.
3. THE BORDER AND LETTERING OF THE SIGNS SHALL BE BLUE (NON-REFLECTIVE) ON WHITE BACKGROUND.
4. ALL DIMENSIONS SHOWN ARE IN INCHES, UNLESS OTHERWISE INDICATED.

FUNDING SIGN EXHIBIT

**County of El Dorado, State of California
Department of Transportation**

CIP No. 77137, Contract No. 3605

GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT

THIS AGREEMENT ("Agreement") approved by the Board of Supervisors this ____st day of _____, in the year of 20__, made and concluded, in duplicate, between the COUNTY OF EL DORADO, a political subdivision of the State of California, by the Department of Transportation thereof, the party of the first part hereinafter called "County," and [CONTRACTOR], party of the second part hereinafter called "Contractor."

RECITALS:

WHEREAS, County has caused the above-captioned project to be let to formal bidding process; and

WHEREAS, Contractor has duly submitted a bid response for the captioned project upon which County has awarded this Contract;

NOW, THEREFORE, the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree, each with the other, as follows:

Article 1. THE WORK

The improvement contemplated in the performance of this Contract is an improvement over which the County shall exercise general supervision. The County, therefore, shall have the right to assume full and direct control over this Contract whenever the County, at its sole discretion, shall determine that its responsibility is so required.

Contractor shall complete the Work as specified or indicated under the Bid Schedule(s) of County's Contract Documents entitled:

GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT

The Project is located in County of El Dorado (insert location description from NTB). The Work to be done is shown on the Plans, described in the Special Provisions and generally consists of, but is not limited to:

Relocation and abandonment of an existing EID waterline, construction of a new cast-in-place concrete slab bridge over Slate Creek, removal of the existing structure and obliteration of the existing roadway alignment, grading and paving for the new bridge approaches and re-aligned roadway, guardrail and fence installation, roadway and ditch excavation, rock slope protection installation, signing and striping, and permanent erosion control installation. Other items or details not mentioned above, that are required by the plans, Standard Plans, Standard Specifications, or these Special Provisions must be performed, constructed or installed.

Article 2. CONTRACT DOCUMENTS

The Contract Documents consist of: the Notice to Bidders; the bid forms which include the accepted Proposal, Bid Price Schedule and Total Bid, Subcontractor List, DBE Information, Equal Employment Opportunity Certification, Section 10285.1 Statement, Section 10162 Questionnaire, Section 10232 Statement, Noncollusion Affidavit, Iran Contracting Act Certification, Debarment, Suspension, Ineligibility, and Voluntary Exclusion Certification, Non-lobbying Certification for Federal-Aid Contracts, Disclosure of Lobbying Activities (Standard Form LLL), Form FHWA 1273; the Contract which includes this Agreement with all Exhibits thereto, including the Fair Employment Practices Addendum and the Nondiscrimination Assurances, the Performance Bond, and Payment Bond, the Exhibit 15-G Construction Contract DBE

Greenstone Rd at Slate Creek Bridge Replacement
CIP No 77137, Contract No. 3605
March 5, 2019

County of El Dorado
Agreement
C-1

Commitment form, Exhibit 15-H DBE Information Good Faith Efforts form; the drawings listed and identified as the Project Plans; the Special Provisions which incorporate by reference the State of California Department of Transportation (Caltrans) Standard Plans 2015, and Standard Specifications 2015, Revised Standard Specifications, and standard drawings from the Design and Improvement Standards Manual of the County of El Dorado, revised March 8, 1994 including Resolution 199-91 and Resolution 58-94 to adopt changes to the Design and Improvement Standards Manual; all Addenda incorporated in those documents before their execution, and all Contract Change Orders issued in accordance with the Contract Documents which may be delivered or issued after the Effective Date of this Agreement and are not attached hereto; the prevailing Labor Surcharge And Equipment Rental Rates (when required) as determined by the Caltrans to be in effect on the date the Work is accomplished; all the obligations of County and of Contractor which are fully set forth and described therein; and all Contract Documents which are hereby specifically referred to and by such reference made a part hereof. All Contract Documents are intended to cooperate so that any Work called for in one and not mentioned in the other is to be executed the same as if mentioned in all Contract Documents. Contractor agrees to perform all of its promises, covenants, and conditions set forth in the Contract Documents, and to abide by and perform all terms and conditions set forth therein. In case of conflict between this Agreement and any other Contract Document, this Agreement shall take precedence.

Article 3. COVENANTS AND CONTRACT PRICE

County hereby promises and agrees with said Contractor to employ, and does hereby employ, said Contractor to provide the material and to do the Work according to the terms and conditions of the Contract Documents herein contained and referred to, for the prices hereinafter set forth, and hereby contracts to pay the same at the time, in the manner and upon the conditions herein set forth; and the said parties for themselves, their heirs, executors, administrators, successors and assigns, do hereby agree to the full performance of the covenants herein contained. County shall pay Contractor for the completion of the Work in accordance with the Contract Documents in current funds the Contract Prices named in Contractor's Bid and Bid Price Schedule, a copy of which is attached hereto as Exhibit A.

Article 4. COMMENCEMENT AND COMPLETION

The Work to be performed under this Contract shall commence on the date specified in the Notice to Proceed issued by County, and the Work shall be fully completed within the time specified in the Notice to Proceed pursuant to Section 8 of the Special Provisions.

County and Contractor recognize that time is of the essence of the Agreement and that County will suffer financial loss if the Work is not completed within the time specified in the Notice to Bidders annexed hereto, plus any extensions thereof allowed in accordance with Section 8 of the Standard Specifications and Special Provisions. They also recognize the delays, expense, and difficulties involved with proving in a legal proceeding the actual loss suffered by County if the Work is not completed on time. Accordingly, instead of requiring any such proof, County and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay County the sum of **\$4,800**, as liquidated damages and not as a penalty, for each and every calendar day's delay in finishing the Work in excess of the Contract time prescribed herein.

Article 5. INDEMNITY

To the fullest extent allowed by law, Contractor shall defend, indemnify, and hold County, its (their) officers, directors, and employees, and the State of California (State), its officers, directors, agents (excluding agents who are design professionals), any property owners from whom the County obtained easements, and any Federal government agencies associated with this Contract harmless against and from any and all claims, suits, losses, damages, and liability for damages, including attorney's fees and other costs of defense brought for or on account of injuries to or death of any person, including but not limited to, workers and the public, or on account of injuries to or death of County, State, any property owners from whom the County obtained easements, or Federal government agency employees, or damage to property, or any economic, consequential or special damages which are claimed or which shall in any way arise out of or be connected with Contractor's services, operations or performance hereunder, regardless of the existence or

degree of fault or negligence on the part of the County, the State of California, or any Federal government agencies, any property owners from whom the County has obtained easements, the Contractor, subcontractors or employees of any of these, except for the active, or sole negligence of the County, the State of California or any Federal government agencies their officers and employees, or any property owners from whom the County has obtained easements, or where expressly prescribed by statute.

The duty to indemnify and hold harmless the County, the State, any property owners from whom the County obtained easements, and any Federal government agencies associated with this Contract specifically includes the duties to defend set forth in Section 2778 of the Civil Code. The insurance obligations of Contractor are separate, independent obligations under the Contract Documents, and the provisions of this defense and indemnity are not intended to modify nor should they be construed as modifying or in any way limiting the insurance obligations set forth in the Contract Documents.

This indemnification will remain in effect until terminated or modified in writing by mutual agreement.

Article 6. VENUE

Any litigation arising out of this Contract shall be brought in El Dorado County and governed by California law.

Article 7. NOTIFICATION OF SURETY COMPANY

The surety company shall familiarize itself with all of the conditions and provisions of this Contract, and shall waive the right of special notification of any change or modifications of this Contract or extension of time, or of decreased or increased work, or of the cancellation of the Contract, or of any other act or acts by County or its authorized agents, under the terms of this Contract; and failure to so notify the aforesaid surety company of changes shall in no way relieve the surety company of its obligation under this Contract.

Article 8. ASSIGNMENT OF ANTITRUST ACTIONS

In entering into a public works Contract or a Subcontract to supply goods, services, or materials pursuant to a public works Contract, the Contractor offers and agrees and will require all of its subcontractors and suppliers to agree to assign to the awarding 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 Professions 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 Contractor, without further acknowledgment by the parties.

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Government Code Sections 4550-4554, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery. Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under Government Code Sections 4550-4554 if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

Article 9. TERMINATION BY COUNTY FOR CONVENIENCE

County reserves the right to terminate the Contract at any time upon determination by County's representative that termination of the Contract is in the best interest of County. County shall issue Contractor a written notice specifying that the Contract is to be terminated.

Upon receipt of said written notice, Contractor shall stop all Work under the Contract except: (1) Work specifically directed to be completed prior to termination, (2) Work the Inspector deems necessary to secure the project for termination, (3) removal of equipment and plant from the site of the Work, (4) action that is necessary to protect materials from damage, (5) disposal of materials not yet used in the Work as directed by County, and (6) clean-up of the site.

If the Contract is terminated for County's convenience as provided herein, all finished or unfinished Work and materials previously paid for shall, at the option of County, become its property. Contractor shall be paid an amount which reflects costs incurred for Work provided to the date of notification of termination. In addition, Contractor shall be paid the reasonable cost, as solely judged by County, and without profit, for all Work performed to secure the project for termination.

Article 10. TERMINATION BY COUNTY FOR CAUSE

If Contractor is adjudged as bankrupt or insolvent, or makes a general assignment for the benefit of its creditors or if a trustee or receiver is appointed for Contractor or for any of its property, or if Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or on more than one occasion fails to supply sufficient skilled workmen or suitable material or equipment, or on more than one occasion fails to make prompt payments to subcontractors for labor, materials, or equipment, or disregards the authority of the County's representative, or the Engineer, if one is appointed, or violates any of the Contract assurances, nondiscrimination provisions or any other Federal or state requirements as identified in Section 7-1.02 of the Special Provisions, or otherwise violates any provision of the Contract Documents, then County may, without prejudice to any other right or remedy and after giving Contractor and its Surety a minimum of ten (10) days from delivery of a written termination notice, terminate the services of Contractor and take equipment and machinery thereon owned by Contractor and finish the Work by whatever method County may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished.

Without prejudice to other rights or remedies County may have, if Contractor fails to begin delivery of materials and equipment, to commence Work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fails to maintain a Work program which will ensure County's interest, or, if Contractor is not carrying out the intent of the Contract, an Inspector's written notice may be served upon Contractor and the Surety on its faithful performance bond demanding satisfactory compliance with the Contract. If Contractor or its Surety does not comply with such notice within five (5) days after receiving it, or after starting to comply, fails to continue, County may exclude it from the premises and take possession of all material and equipment, and complete the Work by County's own forces, by letting the unfinished Work to another Contractor, or by a combination of such methods.

Where Contractor's services have been so terminated by County, said termination shall not affect any right of County against Contractor then existing or which may thereafter accrue. Any retention or payment of monies by County due Contractor will not release Contractor from compliance with the Contract Documents.

If the unpaid balance of the Contract price exceeds the direct and indirect costs of completing the Work, including compensation for additional professional services, such excess shall be paid to Contractor. If the sums under the Contract are insufficient for completion, Contractor or Surety shall pay to County within five (5) days after the completion, all costs in excess of the Contract price. In any event, the cost of completing the Work shall be charged against Contractor and its Surety and may be deducted from any money due or becoming due from County.

The provisions of this Article shall be in addition to all other rights and remedies available to County under law.

If after notice of termination, it is determined for any reason that Contractor was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had not been issued. The Contract shall be equitably adjusted to compensate for such termination.

Article 11. SUCCESSORS AND ASSIGNS

This Agreement shall bind and inure to the heirs, devisees, assignees, and successors in interest of Contractor and to the successors in interest of County in the same manner as if such parties had been expressly named herein.

Article 12. REPORTING ACCIDENTS

Contractor shall prepare and submit (within 24 hours of such incidents) reports of accidents at the site and anywhere else the Work is in progress in which bodily injury is sustained or property loss in excess of Five Hundred Dollars (\$500.00) occurs.

Article 13. EMISSIONS REDUCTION

Contractor shall comply with emission reduction regulations mandated by the California Air Resources Board, and sign a certification of knowledge thereof:

CERTIFICATE OF KNOWLEDGE – EMISSIONS REDUCTION REGULATIONS

I am aware of the emissions reduction regulations being mandated by the California Air Resources Board. I will comply with such regulations before commencing the performance of the Work and maintain compliance throughout the duration of this Contract.

Signed: _____ Date _____

Article 14. WORKERS' COMPENSATION CERTIFICATION

Contractor shall comply with Labor Code Sections 3700 et seq., requiring it to obtain Workers' Compensation Insurance, and sign a certificate of knowledge thereof.

CERTIFICATE OF KNOWLEDGE - LABOR CODE SECTION 3700

I am aware of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of Work of this Contract.

Signed: _____ Date _____

Article 15. WARRANTY

Contractor warrants to County that materials and equipment furnished for the Work will be of good quality and new, unless otherwise required or permitted under the Contract Documents, that the Work will be free from defects or flaws and is of the highest quality of workmanship and that the Work will conform with the requirements herein. Work not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective.

Article 16. RETAINAGE

The retainage from payment is set forth in Section 9-1.16F(1) of the Special Provisions. Contractor may elect to receive one hundred percent (100%) of payments due as set forth in the Contract Documents, without retention, by depositing securities of equivalent value with County, in accordance with, and as set

forth in Section 22300 of the Public Contract Code. Securities eligible for deposit hereunder shall be limited to those listed in Section 16430 of the Government Code, or bank or savings and loan certificates of deposit.

Article 17. DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

The DBE goal for this Contract is 13%.

Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. 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 County deems appropriate. Contractor shall include this assurance in every subcontract entered into as a result of this Agreement.

The Contractor shall carry out applicable requirements of 2 CFR Part 200.321 in the award and administration of this UNITED STATES DEPARTMENT OF TRANSPORTATION (USDOT)-assisted Contract. The applicable requirements of 2 CFR Part 200.321 are as follows:

- (a) *Contracting with small and minority firms, women's business enterprise and labor surplus area firms.*
 - (1) Contractor will take all necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible.
 - (2) Affirmative steps shall include:
 - (i) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - (ii) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
 - (iii) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;
 - (iv) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises;
 - (v) Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce; and
 - (vi) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (a)(2) (i) through (v) of this section.

Bidder will take all necessary affirmative steps to assure that minority firms, women's business enterprises and labor surplus area firms are used when possible.

Article 18. PREVAILING WAGE REQUIREMENTS

In accordance with the provisions of California Labor Code Sections 1770 et seq., including but not limited to Sections 1773, 1773.1, 1773.2, 1773.6, and 1773.7, the general prevailing rate of wages in the county in which the Work is to be done has been determined by the Director of the California Department of Industrial Relations. Interested parties can obtain the current wage information by submitting their requests to the Department of Industrial Relations, Division of Labor Statistics and Research, PO Box 420603, San

Francisco CA 94142-0603, Telephone (415) 703-4708 or by referring to the website at <http://www.dir.ca.gov/OPRL/PWD>. The rates at the time of the bid advertisement date of a project will remain in effect for the life of the project in accordance with the California Code of Regulations, as modified and effective January 27, 1997.

Copies of the general prevailing rate of wages in the county in which the Work is to be done are also on file at the Department of Transportation's principal office, and are available upon request, and in case of projects involving Federal funds, Federal wage requirements as predetermined by the United States Secretary of Labor have been included in the Contract Documents. Addenda to modify the Federal minimum wage rates, if necessary, will be issued as described in the Project Administration section of this Notice to Bidders.

In accordance with the provisions of Labor Code 1810, eight (8) hours of labor constitutes a legal day's work upon all work done hereunder, and Contractor and any Subcontractor employed under this Contract must conform to and be bound by the provisions of Labor Code Sections 1810 through 1815.

In the case of Federally funded projects, where Federal and State prevailing wage requirements apply, compliance with both is required. This project is funded in whole or part by Federal funds. Comply with Exhibit D of this Agreement and the Copeland Act (18 U.S.C. 874 and 29 CFR Part 3), the Davis-Bacon Act (40 U.S.C. 276a to 276a-7 and 29 CFR Part 5), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330 and 29 CFR Part 5).

If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, Contractor and Subcontractors must pay not less than the higher wage rate. The Department of Transportation will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by Contractor and Subcontractors, Contractor and Subcontractors must pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

Article 19. NONDISCRIMINATION

A. In connection with its performance under this Contract, Contractor shall comply with all applicable nondiscrimination statutes and regulations during the performance of this Contract including, but not limited to the following: Contractor, its employees, subcontractors and representatives shall not unlawfully discriminate against any employee or applicant for employment because of race, color, sex, sexual orientation, religion, ancestry or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave or disability leave. Contractor will take affirmative action to ensure that employees are treated during employment, without regard to their race, color, sex, sexual orientation, religion, ancestry or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave or disability leave. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor shall post in conspicuous places, available to employees for employment, notices to be provided by State setting forth the provisions of this Fair Employment section. Contractor shall, unless exempt, comply with the applicable provisions of the Fair Employment and Housing Act (Government Code, Sections 12900 et seq.) and applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Sections 7285.0 et seq.); the applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12990, set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations incorporated into this Agreement by reference and made a part hereof as if set forth in full; and Title VI of the Civil Rights Act of 1964, as amended. Contractor, its employees,

subcontractors and representatives shall give written notice of their obligations under this clause as required by law.

- B. Where applicable, Contractor shall include these nondiscrimination and compliance provisions in any of its subcontracts that affect or are related to the Work performed herein.
- C. The Congress of the United States, the Legislature of the State of California and the Governor of the State of California, each within their respective jurisdictions, have prescribed certain nondiscrimination requirements with respect to Contract and other work financed with public funds. Contractor agrees to comply with the requirements of Exhibit B, marked "Fair Employment Practices Addendum" and the requirements of Exhibit C, marked "Nondiscrimination Assurances," including Appendices A through D to Exhibit C, both of which exhibits and all of the Appendices to Exhibit C are incorporated herein and made by reference a part hereof. Contractor further agrees that any agreement entered into by Contractor with a third party for the performance of project-related Work shall incorporate Exhibits B and C and Appendices A through D to Exhibit C (with third party's name replacing Contractor) as essential parts of such agreement to be enforced by that third party as verified by Contractor.
- D. Contractor's signature executing this Contract shall provide any certifications necessary under the Federal laws and the laws of the State of California, including but not limited to Government Code Section 12990 and Title 2, California Code of Regulations, Section 8103.

Article 20. CONTRACTOR ASSURANCES

By executing this Contract, Contractor certifies that it:

- a. Will abide by all administrative, contractual or legal remedies in instances where Contractor violates or breaches Contract terms, and will comply with sanctions and penalties as the Contract Administrator deems appropriate.
- b. Will comply with the termination for cause and termination for convenience provisions of the Contract including the manner by which such termination may be effected and the basis for settlement afforded by those provisions.
- c. Will comply with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR Chapter 60).
- d. Will comply with the Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR Part 3).
- e. Will comply with the Davis-Bacon Act (40 U.S.C. 276a to 276a-7) as supplemented in Department of Labor regulations (29 CFR part 3).
- f. Will comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5).
- g. Will comply with County, State of California and FHWA requirements and regulations pertaining to: (a) reporting; (b) patent rights with respect to any discovery or invention which arises or is developed in the course of or under this Contract; and (c) copyrights and rights in data.
- h. Will comply with all applicable standards, orders or requirements issued under Section 306 of the Clean Air Act (42 U.S.C. 1857 [h]), Section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15).

- i. Will comply with mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. : 94-163, 89 Stat. 871).
- j. Will comply with: (i) Section 504 of the Rehabilitation Act of 1973 (Rehabilitation Act) which prohibits discrimination on the basis of disability in Federally assisted programs; (ii) the Americans with Disabilities Act (ADA) of 1990 which prohibits discrimination on the basis of disability irrespective of funding; and (iii) all applicable regulations and guidelines issued pursuant to both the Rehabilitation Act and the ADA.
- k. Will comply with the Department of Industrial Relations pursuant to Labor Code sections 1725.5 and 1771.1.

Any Subcontract entered into as a result of this Contract shall contain all of the provisions of this Article.

Article 21. BUSINESS LICENSE

The County Business License Ordinance provides that it is unlawful for any person to furnish supplies or services, or transact any kind of business in the unincorporated territory of County of El Dorado without possessing a County business license unless exempt under County Ordinance Code Section 5.08.070. Contractor warrants and represents that it shall comply with all of the requirements of the County Business License Ordinance, where applicable, prior to beginning Work under this Contract and at all times during the term of this Contract.

Article 22. TAXES

Contractor certifies that as of today's date, it is not in default on any unsecured property taxes or other taxes or fees owed by Contractor to County. Contractor agrees that it shall not default on any obligations to County during the term of this Agreement.

Article 23. CONTRACT ADMINISTRATOR

The County Officer or employee with responsibility for administering this Agreement is John Kahling, Deputy Director Engineering, Headington Unit, Department of Transportation, or successor.

Article 24. AUTHORIZED SIGNATURES

The parties hereto represent that the undersigned individuals executing this Agreement on behalf of their respective parties are fully authorized to do so by law or other appropriate instrument and to bind upon said parties the obligations set forth herein.

Article 25. PARTIAL INVALIDITY

If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions will continue in full force and effect without being impaired or invalidated in any way.

Article 26. NO THIRD PARTY BENEFICIARIES

Nothing in this Agreement is intended, nor will be deemed, to confer rights or remedies upon any person or legal entity not a party to this Agreement.

Article 27. COUNTERPARTS

This Agreement may be executed in one or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument.

Article 28. ENTIRE AGREEMENT

This document and the documents referred to herein or exhibits hereto are the entire Agreement between the parties and they incorporate or supersede all prior written or oral agreements or understandings.

Draft

IN WITNESS WHEREOF, the said Department of Transportation of the County of El Dorado, State of California, has caused this Agreement to be executed by County's Board of Supervisors, on its behalf, and the said Contractor has signed this Agreement the day and year written below.

COUNTY OF EL DORADO

Dated: _____

Chair, Board of Supervisors

Board Date: _____

Attest:
James S. Mitrison
Clerk of the Board of Supervisors

Dated: _____

Board Date: _____

Deputy Clerk

CONTRACTOR

Dated: _____ License No. _____ Federal Employee Identification Number _____

By: _____
President

By: _____
Corporate Secretary

NOTE: If Contractor is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign Contracts on behalf of the corporation; if Contractor is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign Contracts on behalf of the co-partnership; and if Contractor is an individual, his/her signature shall be placed above. Contractor executing this document on behalf of a corporation or partnership shall be prepared to demonstrate by resolution, article, or otherwise that it is appropriately authorized to act in these regards. For such corporation or partnership, such authority shall be demonstrated to the satisfaction of County. If signature is by an agent, other than officer of a corporation or a member of a partnership, an appropriate Power of Attorney shall be on file with the County prior to signing this document.

Mailing Address: _____

Business Address: _____

Email Address: _____

Phone: _____ Fax: _____

EXHIBIT A
CONTRACTOR'S BID AND BID PRICE SCHEDULE
GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT
CIP NO. 77137, CONTRACT NO. 3605

| ITEM NO. | ITEM CODE | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|-------------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 1 | 070030 | LEAD COMPLIANCE PLAN | LS | 1 | | |
| 2 | 070030A | FIRE SAFETY PLAN | LS | 1 | | |
| 3 | 072007A | EXCAVATION SAFETY | LS | 1 | | |
| 4 | 080050 | PROGRESS SCHEDULE (CRITICAL PATH METHOD) | LS | 1 | | |
| 5 | 100100 | DEVELOP WATER SUPPLY | LS | 1 | | |
| 6 | 120090 | CONSTRUCTION AREA SIGNS | LS | 1 | | |
| 7 | 120090A | CONSTRUCTION PROJECT INFORMATION SIGNS | LS | 1 | | |
| 8 | 120100 | TRAFFIC CONTROL SYSTEM | LS | 1 | | |
| 9 | 128651A | PORTABLE CHANGEABLE MESSAGE SIGN | SWD | 500 | | |
| 10 | 129000 | TEMPORARY RAILING (TYPE K) | LF | 60 | | |
| 11 | 130100 | JOB SITE MANAGEMENT | LS | 1 | | |
| 12 | 130300 | PREPARE STORM WATER POLLUTION PREVENTION PLAN | LS | 1 | | |
| 13 | 130310 | RAIN EVENT ACTION PLAN | EA | 5 | | |
| 14 | 130330 | STORM WATER ANNUAL REPORT | LS | 1 | | |
| 15 | 130580A | TEMPORARY WATER DIVERSION | LS | 1 | | |
| 16 | 131103 | WATER QUALITY SAMPLING AND ANALYSIS DAY | EA | 3 | | |
| 17 | 140003 | ASBESTOS COMPLIANCE PLAN | LS | 1 | | |
| 18 | 141000A | TEMPORARY FENCE (TYPE ESA) | LF | 1000 | | |
| 19 | 141103 | REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS | LF | 20 | | |

Greenstone Rd at Slate Creek Bridge Replacement
CIP No 77137, Contract No. 3605
 March 5, 2019

County of El Dorado
Agreement
 C-12

| ITEM NO. | ITEM CODE | | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|---|---------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| | | | WASTE) | | | | |
| 20 | 149001A | | PREPARE ASBESTOS DUST MITIGATION PLAN | LS | 1 | | |
| 21 | 170103 | | CLEARING AND GRUBBING | LS | 1 | | |
| 22 | 170103A | | REMOVE TREE | EA | 81 | | |
| 23 | 190101 | F | ROADWAY EXCAVATION | CY | 332 | | |
| 24 | 192003 | F | STRUCTURE EXCAVATION (BRIDGE) | CY | 156 | | |
| 25 | 192035 | F | STRUCTURE EXCAVATION (ROCK) | CY | 58 | | |
| 26 | 193003 | F | STRUCTURE BACKFILL (BRIDGE) | CY | 134 | | |
| 27 | 198010 | F | IMPORTED BORROW | CY | 1650 | | |
| 28 | 210270A | | ROLLED EROSION CONTROL PRODUCT (NETTING, TYPE B) | SQFT | 985 | | |
| 29 | 210280A | | ROLLED EROSION CONTROL PRODUCT (BLANKET, TYPE B) | SQFT | 16,340 | | |
| 30 | 210430 | | HYDROSEED | SQFT | 17,325 | | |
| 31 | 260203 | | CLASS 2 AGGREGATE BASE (CY) | CY | 522 | | |
| 32 | 390132 | | HOT MIX ASPHALT (TYPE A) | TON | 689 | | |
| 33 | 398200 | | COLD PLANE ASPHALT CONCRETE PAVEMENT | SQYD | 79 | | |
| 34 | 510051 | F | STRUCTURAL CONCRETE, BRIDGE FOOTING | CY | 53 | | |
| 35 | 510053 | F | STRUCTURAL CONCRETE, BRIDGE | CY | 90 | | |
| 36 | 510054 | F | STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER) | CY | 82 | | |
| 37 | 519088 | P | JOINT SEAL (MR 1") | LF | 70 | | |
| 38 | 520102 | P | BAR REINFORCING STEEL (BRIDGE) | LB | 25,866 | | |
| 39 | 600097 | | BRIDGE REMOVAL | LS | 1 | | |
| 40 | 723080 | | ROCK SLOPE PROTECTION (60 LB, CLASS II, METHOD B) | CY | 122 | | |

| ITEM NO. | ITEM CODE | | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|--------------------------------------------|-----------|---|--------------------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 41 | 729011 | | ROCK SLOPE PROTECTION FABRIC (CLASS 8) | SQYD | 244 | | |
| 42 | 782200 | | OBLITERATE SURFACING | SQYD | 725 | | |
| 43 | 800052 | | FENCE (TYPE WM, WOOD POST) | LF | 750 | | |
| 44 | 803040 | | REMOVE FENCE (TYPE WM) | LF | 655 | | |
| 45 | 810170A | | DELINEATOR (CLASS 1, TYPE E) | EA | 4 | | |
| 46 | 810180A | | DELINEATOR (CLASS 2, TYPE E) | EA | 14 | | |
| 47 | 810230 | | PAVEMENT MARKER (RETROREFLECTIVE) | EA | 60 | | |
| 48 | 820410 | | SALVAGE ROADSIDE SIGN | EA | 6 | | |
| 49 | 820590 | | RELOCATE ROADSIDE SIGN-ONE POST | EA | 3 | | |
| 50 | 839543 | P | TRANSITION RAILING (TYPE WB-31) | EA | 4 | | |
| 51 | 839585 | P | ALTERNATIVE FLARED TERMINAL SYSTEM | EA | 4 | | |
| 52 | 839740 | P | CALIFORNIA ST-10 BRIDGE RAIL | LF | 148 | | |
| 53 | 840502 | | THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) | LF | 2,103 | | |
| 54 | 999990 | | MOBILIZATION | LS | 1 | | |
| EID WATERLINE RELOCATION WORK ITEMS | | | | | | | |
| 55 | 770100A | P | 6-INCH DUCTILE IRON PIPE | LF | 75 | | |
| 56 | 770200A | P | 12-INCH DUCTILE IRON PIPE | LF | 598 | | |
| 57 | 770300A | P | 12-INCH TR-FLEX DUCTILE IRON PIPE | LF | 72 | | |
| 58 | 490590A | P | 22-INCH STEEL CASING | LF | 60 | | |
| 59 | 770400A | | CASING SAND | LS | 1 | | |
| 60 | 208590 | P | 6-INCH GATE VALVE | EA | 2 | | |
| 61 | 208590A | P | 12-INCH GATE VALVE | EA | 2 | | |
| 62 | 208635A | P | 2-INCH AIR RELEASE VALVE | EA | 2 | | |

| ITEM NO. | ITEM CODE | | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|---|------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 63 | 208589A | P | 4-INCH BLOW OFF ASSEMBLY | EA | 1 | | |
| 64 | 770500A | | TIE-IN 'A' | LS | 1 | | |
| 65 | 770500B | | TIE-IN 'B' | LS | 1 | | |
| 66 | 770500C | | TIE-IN 'C' | LS | 1 | | |
| 67 | 770500D | | TIE-IN 'D' | LS | 1 | | |
| 68 | 710114A | | ABANDON EXISTING FACILITIES | LS | 1 | | |
| 69 | 610001A | | HYDROSTATIC PRESSURE TESTING | LS | 1 | | |
| 70 | 770600A | | DISINFECTION | LS | 1 | | |

(F) Final Pay Quantity
(P) Eligible for Partial Payment
(LS) Lump Sum

EXHIBIT B

FAIR EMPLOYMENT PRACTICES ADDENDUM

1. In the performance of this Agreement, Contractor will not discriminate against any employee for employment because of race, color, sex, sexual orientation, religion, ancestry or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave or disability leave. Contractor will take affirmative action to ensure that employees are treated during employment, without regard to their race, color, sex, sexual orientation, religion, ancestry or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave or disability leave. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor shall post in conspicuous places, available to employees for employment, notices to be provided by State setting forth the provisions of this Fair Employment section.
2. Contractor and all Subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 1290-0 et seq.), and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900(a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Each of Contractor's contractors and all Subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreements, as appropriate.
3. Contractor shall include the nondiscrimination and compliance provisions of this clause in all contracts and subcontracts to perform Work under this Agreement.
4. Contractor will permit access to the records of employment, employment advertisements, application forms and other pertinent data and records by County, State, the State Fair Employment and Housing Commission or any other agency of the State of California designated by State, for the purposes of investigation to ascertain compliance with the Fair Employment section of this Agreement.
5. Remedies for Willful Violation:
 - (a) County may determine a willful violation of the Fair Employment provision to have occurred upon receipt of a final judgment to that effect from a court in an action to which Contractor was a party, or upon receipt of a written notice from the Fair Employment and Housing Commission that it has investigated and determined that Contractor has violated the Fair Employment Practices Act and had issued an order under Labor Code Section 1426 which has become final or has obtained an injunction under Labor Code Section 1429.
 - (b) For willful violation of this Fair Employment provision, County shall have the right to terminate this Agreement either in whole or in part, and any loss or damage sustained by County in securing the goods or services thereunder shall be borne and paid for by Contractor and by the surety under the performance bond, if any, and County may deduct from any moneys due or thereafter may become due to Contractor, the difference between the price named in the Agreement and the actual cost thereof to County to cure Contractor's breach of this Agreement.

EXHIBIT C
NONDISCRIMINATION ASSURANCES

Contractor hereby agrees that, as a condition to receiving any Federal financial assistance from County or the State, acting for the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d-42 U.S.C. 2000d-4 (hereinafter referred to as the Act), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, "Nondiscrimination in Federally-Assisted Programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964" (hereinafter referred to as the Regulations), the Federal-aid Highway Act of 1973, and other pertinent directives, to the end that in accordance with the Act, Regulations, and other pertinent directives, no person in the United States shall, on the grounds of race, color, sex, national origin, religion, age or disability, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which County receives Federal financial assistance from the Federal Department of Transportation. Contractor hereby gives assurance that Contractor will promptly take any measures necessary to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

More specifically, and without limiting the above general assurance, Contractor hereby gives the following specific assurances with respect to its Federal-aid Program:

1. That Contractor agrees that each "program" and each "facility" as defined in subsections 21.23 (e) and 21.23 (b) of the Regulations, will be (with regard to a "program") conducted, or will be (with regard to a "facility") operated in compliance with all requirements imposed by, or pursuant to, the Regulations.

2. That Contractor shall insert the following notification in all solicitations for bids for work or material subject to the Regulations made in connection with the Federal-aid Program and, in adapted form, in all proposals for negotiated agreements:

Contractor hereby notifies all bidders that it will affirmatively insure that in any agreement entered into pursuant to this advertisement, minority 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, sex, national origin, religion, age, or disability in consideration for an award.

3. That Contractor shall insert the clauses of Appendix A of this assurance in every agreement subject to the Act and the Regulations.

4. That the clauses of Appendix B of this Assurance shall be included as a covenant running with the land, in any deed effecting a transfer of real property, structures, or improvements thereon, or interest therein.

5. That where Contractor receives Federal financial assistance to construct a facility, or part of a facility, the Assurance shall extend to the entire facility and facilities operated in connection therewith.

6. That where Contractor receives Federal financial assistance in the form, or for the acquisition, of real property or an interest in real property, the Assurance shall extend to rights to space on, over, or under such property.

7. That Contractor shall include the appropriate clauses set forth in Appendix C and D of this Assurance, as a covenant running with the land, in any future deeds, leases, permits, licenses, and similar agreements entered into by Contractor with other parties:

Appendix C;

(a) For the subsequent transfer of real property acquired or improved under the Federal-aid Program; and

Appendix D;

(b) For the construction or use of or access to space on, over, or under real property acquired, or improved under the Federal-aid Program.

8. That this assurance obligates Contractor for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of,

personal property or real property of interest therein, or structures, or improvements thereon, in which case the assurance obligates Contractor or any transferee for the longer of the following periods:

(a) The period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or

(b) The period during which Contractor retains ownership or possession of the property.

9. That Contractor shall provide for such methods of administration for the program as are found by the U.S. Secretary of Transportation, or the official to whom he delegates specific authority, to give reasonable guarantee that Contractor, other recipients, sub-grantees, applicants, sub-applicants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed by, or pursuant to, the Act, the Regulations, this Assurance and the Agreement.

10. That Contractor agrees that County, the United States and the State of California have a right to seek judicial enforcement with regard to any matter arising under the Act, the Regulations, and this Assurance.

11. Contractor shall not discriminate on the basis of race, religion, age, disability, color, national origin or sex in the award and performance of any State assisted Contract or in the administration of County's DBE Program or the requirements of 49 CFR Part 26. Contractor shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of State assisted Contracts. County's DBE Race-Neutral Implementation Agreement is incorporated by reference in this Agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this Agreement. Upon notification to the recipient of its failure to carry out its approved DBE Race-Neutral Implementation Agreement, State may impose sanctions as provided for under 49 CFR Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 USC 1001 and/or the Program Fraud Civil Remedies Act of 1985 (31 USC 3801 et. seq.).

These Assurances are given in consideration of and for the purpose of obtaining any and all Federal grants, loans, agreements, property, discounts or other Federal financial assistance extended after the date hereof to County by State, acting for the U.S. Department of Transportation, and is binding on Contractor, other recipients, subgrantees, applicants, sub-applicants, transferees, successors in interest and other participants in the Federal-aid Highway Program.

APPENDIX A

to

EXHIBIT C

During the performance of this Agreement, Contractor, for itself, its assignees and successors in interest (hereinafter collectively referred to as "Contractor") agrees as follows:

(1) **Compliance with Regulations:** Contractor shall comply with the regulations relative to nondiscrimination in Federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Agreement.

(2) **Nondiscrimination:** Contractor, with regard to the Work performed by it during the Agreement, shall not discriminate on the grounds of race, color, sex, national origin, religion, age, or disability in the selection and retention of sub-applicants, including procurements of materials and leases of equipment. Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Agreement covers a program set forth in Appendix b of the Regulations.

(3) **Solicitations for Sub-agreements, Including procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by Contractor for Work performed under a Sub-agreement, including procurements of materials or leases of equipment, each potential sub-applicant or supplier shall be notified by Contractor of the Contractor's obligations under this Agreement and the Regulations relative to nondiscrimination on the grounds of race, color or national origin.

(4) **Information and Reports:** Contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to Contractor's books, records, accounts, other sources of information, and its facilities as may be determined by County, State or FHWA to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of Contractor is in the exclusive possession of another who fails or refuses to furnish this information, Contractor shall so certify to County, State or the FHWA as appropriate, and shall set forth what efforts Contractor has made to obtain the information.

(5) **Sanctions for Noncompliance:** In the event of Contractor's noncompliance with the nondiscrimination provisions of this Agreement, County shall impose such agreement sanctions as it, the State or the FHWA may determine to be appropriate, including, but not limited to:

- (a) withholding of payments to Contractor under the Agreement within a reasonable period of time, not to exceed 90 days; and/or
- (b) cancellation, termination or suspension of the Agreement, in whole or in part.

(6) **Incorporation of Provisions:** Contractor shall include the provisions of paragraphs (1) through (6) in every sub-agreement, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto.

Contractor shall take such action with respect to any sub-agreement or procurement as County, State or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance, provided, however, that, in the event Contractor becomes involved in, or is threatened with, litigation with a sub-applicant or supplier as a result of such direction, Contractor may request County or State enter into such litigation to protect the interests of County or State, and, in addition, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

**APPENDIX B
to
EXHIBIT C**

(NOT USED)

Draft

**APPENDIX C
to
EXHIBIT C**

(NOT USED)

Draft

APPENDIX D

to

EXHIBIT C

(NOT USED)

Draft

EXHIBIT D

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

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

ATTACHMENTS

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

I. GENERAL

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

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

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

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

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

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the

subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

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

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

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

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

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts

should be aimed at developing full journey level status employees in the type of trade or job classification involved.

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

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

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

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

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

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

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

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

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with

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

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

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

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

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

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

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

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

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

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

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

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

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

employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding

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

3. Payrolls and basic records

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

laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

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

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

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

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

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

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the

"Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the

apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts.The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment.A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements.All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the

overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements.No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts.The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting

agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to

be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However,

failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant

is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is

submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

EXHIBIT E

FEDERAL WAGE RATES

General Decision Number: CA190007
02/01/2019 CA7

Superseded General Decision Number:
CA20180009

State: California

Construction Types: Building, Heavy (Heavy and Dredging) and Highway

Counties: Alpine, Amador, Butte, Colusa, El Dorado, Glenn, Lassen, Marin, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Solano, Sonoma, Sutter, Tehama, Trinity, Yolo and Yuba Counties in California.

BUILDING CONSTRUCTION PROJECTS
(excluding Amador County only);
DREDGING CONSTRUCTION PROJECTS
(does not include hopper dredge work); **HEAVY CONSTRUCTION PROJECTS**
(does not include water well drilling); **AND HIGHWAY CONSTRUCTION PROJECTS**

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the Greenstone Rd at Slate Creek Bridge Replacement **CIP No. 77137, Contract No. 3605** March 5, 2019

contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

| Modification Number | Publication Date |
|---------------------|------------------|
| 0 | 01/04/2019 |
| 1 | 02/01/2019 |

ASBE0016-001 08/01/2018

AREA 1: MARIN, NAPA, SAN BENITO, SAN FRANCISCO, SOLANO, & SONOMA COUNTIES

AREA 2: ALPINE, AMADOR, BUTTE, COLUSA, EL DORADO, GLENN, MODOC, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SUTTER, TEHEMA, TRINITY, YOLO, & YUBA COUNTIES

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| Asbestos Workers/Insulator (Includes the application of all insulating materials, Protective Coverings, Coatings, and Finishes to all types of mechanical systems) | | |
| Area 1..... | \$ 68.11 | 23.28 |
| Area 2..... | \$ 51.71 | 23.28 |

ASBE0016-007 06/25/2018

County of El Dorado
Agreement
C-35

AREA 1 : ALPINE, AMADOR, BUTTE,
 COLUSA, EL DORADO, GLENN,
 LASSEN, MODOC, NEVADA, PLACER,
 PLUMAS, SACRAMENTO, SHASTA,
 SIERRA, SISKIYOU, SOLANO, SONOMA,
 SUTTER, TEHAMA, TRINITY, YOLO
 & YUBA COUNTIES

AREA 2: MARIN & NAPA COUNTIES

| | Rates | Fringes |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| Asbestos Removal worker/hazardous material handler (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials from mechanical systems, whether they contain asbestos or not) | | |
| AREA 1..... | \$ 30.81 | 22.71 |
| AREA 2..... | \$ 31.81 | 22.71 |

BOIL0549-002 10/01/2016

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| BOILERMAKER (1) Marin & Solano Counties..... | \$ 43.28 | |
| 37.91 (2) Remaining Counties..... | \$ 39.68 | |
| 35.71 | | |

BRCA0003-001 08/01/2017

| | Rates | Fringes |
|----------------------|----------|---------|
| MARBLE FINISHER..... | \$ 32.60 | |
| 15.31 | | |

BRCA0003-004 05/01/2017

AREA 1: ALPINE, AMADOR, BUTTE, COLUSA,
 EL DORADO, GLENN,
 LASSEN, MODOC, NEVADA, PLACER,
 PLUMAS, SACRAMENTO, SHASTA,
 SIERRA, SUTTER, TEHAMA, YOLO AND
 YUBA COUNTIES

AREA 2: MARIN, NAPA, SISKIYOU, SOLANO,
 SONOMA AND TRINITY
 COUNTIES

| Rates | Fringes |
|-------------------------------------------------------------------------------------------------------------|---------|
| Greenstone Rd at Slate Creek Bridge Replacement CIP No. 77137, Contract No. 3605 March 5, 2019 | |

BRICKLAYER

| | | |
|-------------|----------|-------|
| AREA 1..... | \$ 39.66 | 20.76 |
| AREA 2..... | \$ 42.34 | 25.83 |

SPECIALTY PAY:

(A) Underground work such as tunnel work,
 sewer work,
 manholes, catch basins, sewer pipes and
 telephone conduit
 shall be paid \$1.25 per hour above the regular
 rate. Work
 in direct contact with raw sewage shall receive
 \$1.25 per

hour in addition to the above.

(B) Operating a saw or grinder shall receive
 \$1.25 per hour
 above the regular rate.

(C) Gunite nozzle person shall receive \$1.25
 per hour above
 the regular rate.

BRCA0003-008 09/01/2017

| | Rates | Fringes |
|-----------------------------|----------|---------|
| TERRAZZO FINISHER..... | \$ 35.14 | |
| 16.87 | | |
| TERRAZZO WORKER/SETTER..... | \$ 44.11 | |
| 26.36 | | |

BRCA0003-010 04/01/2018

| | Rates | Fringes |
|---------------|----------|---------|
| TILE FINISHER | | |
| Area 1..... | \$ 26.04 | 13.75 |
| Area 2..... | \$ 26.36 | 15.97 |
| Area 3..... | \$ 28.56 | 15.87 |
| Area 4..... | \$ 26.69 | 15.31 |
| Tile Layer | | |
| Area 1..... | \$ 43.36 | 16.79 |
| Area 2..... | \$ 43.02 | 18.19 |
| Area 3..... | \$ 47.77 | 18.29 |
| Area 4..... | \$ 44.64 | 18.21 |

AREA 1: Butte, Colusa, El Dorado, Glenn,
 Lassen, Modoc,
 Nevada, Placer, Plumas, Sacramento, Shasta,
 Sierra, Sutter,
 Tehema, Yolo, Yuba
 AREA 2: Alpine, Amador
 AREA 3: Marin, Napa, Solano, Siskiyou
 AREA 4: Sonoma

BRCA0003-014 08/01/2017

County of El Dorado
Agreement
 C-36

| | Rates | Fringes |
|-------------------|----------|---------|
| MARBLE MASON..... | \$ 44.60 | |
| 26.83 | | |

 CARP0034-001 07/01/2018

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| Diver | | |
| Assistant Tender, ROV Tender/Technician..... | \$ 47.65 | |
| 32.52 | | |
| Diver standby..... | \$ 52.61 | 32.52 |
| Diver Tender..... | \$ 51.82 | 32.52 |
| Diver wet..... | \$ 97.17 | 32.52 |
| Manifold Operator (mixed gas)..... | \$ 56.82 | 32.52 |
| Manifold Operator (Standby).\$ | 51.82 | |
| 32.52 | | |

DEPTH PAY (Surface Diving):
 050 to 100 ft \$2.00 per foot
 101 to 150 ft \$3.00 per foot
 151 to 220 ft \$4.00 per foot

SATURATION DIVING:
 The standby rate shall apply until saturation starts. The saturation diving rate applies when divers are under pressure continuously until work task and decompression are complete. The diver rate shall be paid for all saturation hours.

DIVING IN ENCLOSURES:
 Where it is necessary for Divers to enter pipes or tunnels, or other enclosures where there is no vertical ascent, the following premium shall be paid: Distance traveled from entrance 26 feet to 300 feet: \$1.00 per foot. When it is necessary for a diver to enter any pipe, tunnel or other enclosure less than 48" in height, the premium will be \$1.00 per foot.

WORK IN COMBINATION OF CLASSIFICATIONS:
 Employees working in any combination of classifications within the diving crew (except dive supervisor) in a shift

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are paid in the classification with the highest rate for that shift.

 CARP0034-003 07/01/2017

| | Rates | Fringes |
|-----------------|----------|---------|
| Piledriver..... | \$ 46.65 | 31.91 |

 CARP0035-001 08/01/2018

AREA 1: MARIN, NAPA, SOLANO & SONOMA

 AREA 3: SACRAMENTO, WESTERN EL DORADO (Territory west of an including highway 49 and the territory inside the city limits of Placerville), WESTERN PLACER (Territory west of and including highway 49), & YOLO

AREA 4: ALPINE, BUTTE, COLUSA, EASTERN EL DORADO, GLENN, LASSEN, MODOC, NEVADA, EASTERN PLACER, PLUMAS, SHASTA, SIERRA, SISKIYOU, SUTTER, TEHAMA, TRINITY, & YUBA

| | Rates | Fringes |
|-----------------------------|----------|---------|
| Drywall Installers/Lathers: | | |
| Area 1..... | \$ 48.40 | 29.76 |
| Area 3..... | \$ 43.02 | 29.76 |
| Area 4..... | \$ 41.67 | 29.76 |
| Drywall Stocker/Scrapper | | |
| Area 1..... | \$ 24.20 | 17.29 |
| Area 3..... | \$ 21.51 | 17.51 |
| Area 4..... | \$ 20.84 | 17.29 |

 CARP0035-009 07/01/2018

Marin County

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------------------|----------|---------|
| CARPENTER | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 48.55 | 29.32 |
| Journeyman Carpenter..... | \$ 48.40 | 29.32 |
| 29.32 | | |
| Millwright..... | \$ 48.50 | 30.91 |

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CARP0035-010 07/01/2017

AREA 1: Marin, Napa, Solano & Sonoma Counties

AREA 2: Monterey, San Benito and Santa Cruz

AREA 3: Alpine, Butte, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Yolo & Yuba counties

| | Rates | Fringes |
|-----------------------------|----------|---------|
| Modular Furniture Installer | | |
| Area 1 | | |
| Installer I..... | \$ 24.91 | 19.63 |
| Installer II..... | \$ 22.18 | 20.42 |
| Lead Installer..... | \$ 29.06 | 20.92 |
| Master Installer..... | \$ 33.28 | 20.92 |
| Area 2 | | |
| Installer I..... | \$ 22.96 | 20.42 |
| Installer II..... | \$ 20.01 | 20.42 |
| Lead Installer..... | \$ 25.93 | 20.92 |
| Master Installer..... | \$ 29.56 | 20.92 |
| Area 3 | | |
| Installer I..... | \$ 22.01 | 20.42 |
| Installer II..... | \$ 19.24 | 20.42 |
| Lead Installer..... | \$ 24.81 | 20.92 |
| Master Installer..... | \$ 31.83 | 20.92 |

CARP0046-001 07/01/2018

El Dorado (West), Placer (West), Sacramento and Yolo Counties

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 42.67 | 29.32 |
| Journeyman Carpenter..... | \$ 42.52 | 29.32 |
| Millwright..... | \$ 45.02 | 30.91 |

Footnote: Placer County (West) includes territory West of and including Highway 49 and El Dorado County (West) includes territory West of and including Highway 49 and territory Greenstone Rd at Slate Creek Bridge Replacement
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inside the city limits of Placerville.

CARP0046-002 07/01/2018

Alpine, Colusa, El Dorado (East), Nevada, Placer (East), Sierra, Sutter and Yuba Counties

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 41.32 | 29.32 |
| Journeyman Carpenter..... | \$ 40.17 | 29.32 |
| Millwright..... | \$ 43.67 | 30.91 |

CARP0152-003 07/01/2018

Amador County

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 41.32 | 29.32 |
| Journeyman Carpenter..... | \$ 41.17 | 29.32 |
| Millwright..... | \$ 43.67 | 30.91 |

CARP0180-001 07/01/2018

Solano County

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 48.55 | 29.32 |
| Journeyman Carpenter..... | \$ 48.40 | 29.32 |
| Millwright..... | \$ 48.50 | 30.91 |

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CARP0751-001 07/01/2018

Napa and Sonoma Counties

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 48.55 | 29.32 |
| Journeyman Carpenter..... | \$ 48.50 | |
| 29.32 | | |
| Millwright..... | \$ 48.50 | 30.91 |

CARP1599-001 07/01/2018

Butte, Glenn, Lassen, Modoc, Plumas, Shasta,
Siskiyou, Tehama
and Trinity Counties

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------------------------|----------|---------|
| Carpenters | | |
| Bridge Builder/Highway Carpenter..... | \$ 48.40 | 29.32 |
| Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer..... | \$ 41.32 | 29.32 |
| Journeyman Carpenter..... | \$ 41.17 | |
| 29.32 | | |
| Millwright..... | \$ 43.67 | 30.91 |

ELEC0180-001 06/01/2017

NAPA AND SOLANO COUNTIES

| | Rates | Fringes |
|--------------------|----------|---------|
| CABLE SPLICER..... | \$ 50.97 | |
| 3%+20.13 | | |
| ELECTRICIAN..... | \$ 47.31 | |
| 23.05 | | |

ELEC0180-003 12/01/2018

NAPA AND SOLANO COUNTIES

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| Sound & Communications | | |
| Installer..... | \$ 38.42 | 20.20 |
| Greenstone Rd at Slate Creek Bridge Replacement | | |
| CIP No. 77137, Contract No. 3605 | | |
| March 5, 2019 | | |

Technician.....\$ 44.18 20.20

SCOPE OF WORK INCLUDES-
SOUND & VOICE TRANSMISSION (Music,
Intercom, Nurse Call,
Telephone); FIRE ALARM SYSTEMS
[excluding fire alarm work
when installed in raceways (including wire and
cable
pulling) and when performed on new or major
remodel
building projects or jobs],
TELEVISION & VIDEO SYSTEMS, SECURITY
SYSTEMS, COMMUNICATIONS
SYSTEMS that transmit or receive information
and/or control
systems that are intrinsic to the above.

EXCLUDES-
Excludes all other data systems or multiple
systems which
include control function or power supply;
excludes
installation of raceway systems, line voltage
work,
industrial work, life-safety systems (all
buildings having
floors located more than 75' above the lowest
floor level
having building access); excludes energy
management
systems.

ELEC0340-002 02/01/2018

ALPINE, AMADOR, BUTTE, COLUSA, EL
DORADO, GLENN, LASSEN,
NEVADA, PLACER, PLUMAS, SACRAMENTO,
TRINITY, YOLO, YUBA COUNTIES

Rates Fringes

| | | |
|-------------------------------------------|----------|----------|
| Communications System | | |
| Sound & Communications Installer..... | \$ 29.35 | 3%+15.35 |
| Sound & Communications Technician..... | \$ 33.75 | 3%+15.35 |

SCOPE OF WORK

Includes the installation testing, service and
maintenance,
of the following systems which utilize the
transmission
and/or transference of voice, sound, vision and
digital for

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commercial, education, security and entertainment purposes for the following TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms, and low voltage master clock systems.

A. SOUND AND VOICE TRANSMISSION/TRANSFERENCE SYSTEMS

Background foreground music Intercom and telephone interconnect systems, Telephone systems, Nurse call systems, Radio page systems, School intercom and sound systems, Burglar alarm systems, Low voltage master clock systems, Multi-media/multiplex systems, Sound and musical entertainment systems, RF systems, Antennas and Wave Guide.

B. FIRE ALARM SYSTEMS

Installation, wire pulling and testing

C. TELEVISION AND VIDEO SYSTEMS

Television monitoring and surveillance systems, Video security systems, Video entertainment systems, Video educational systems, Microwave transmission systems, CATV and CCTV

D. SECURITY SYSTEMS Perimeter security systems

Vibration sensor systems Card access systems Access control systems Sonar/infrared monitoring equipment

E. COMMUNICATIONS SYSTEMS THAT TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED SYSTEMS SCADA

(Supervisory Control and Data Acquisition) PCM (Pulse Code Modulation) Inventory Control Systems Digital Data Systems Broadband and Baseband and Carriers Point of Sale Greenstone Rd at Slate Creek Bridge Replacement **CIP No. 77137, Contract No. 3605** March 5, 2019

Systems VSAT Data Systems Data Communication Systems RF and Remote Control Systems Fiber Optic Data Systems WORK EXCLUDED Raceway systems are not covered

(excluding Ladder-Rack for the purpose of the above listed systems). Chases and/or nipples (not to exceed 10 feet) may be installed on open wiring systems. Energy management systems. SCADA (Supervisory Control and Data Acquisition) when not intrinsic to the above listed systems (in the scope). Fire alarm systems when installed in raceways (including wire and cable pulling) shall be performed at the electrician wage rate, when either of the following two (2) conditions apply:
 1. The project involves new or major remodel building trades construction.
 2. The conductors for the fire alarm system are installed in conduit.

 ELEC0340-003 08/01/2018

ALPINE (West of Sierra Mt. Watershed), AMADOR, BUTTE, COLUSA, EL DORADO (West of Sierra Mt. Watershed), GLENN, LASSEN, NEVADA (West of Sierra Mt. Watershed), PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA (West of Sierra Mt. Watershed), SUTTER, TEHAMA, TRINITY, YOLO & YUBA COUNTIES

| | Rates | Fringes |
|------------------------------|----------|---------|
| ELECTRICIAN | | |
| Remaining area..... | \$ 40.06 | 28.54 |
| Sierra Army Depot, Herlong.. | \$ 48.83 | |
| 18.54 | | |
| Tunnel work..... | \$ 41.01 | 18.54 |

CABLE SPLICER: Receives 110% of the Electrician basic hourly rate.

 ELEC0401-005 07/01/2018

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ALPINE (east of the main watershed divide), EL DORADO (east of the main watershed divide), NEVADA (east of the main watershed), PLACER (east of the main watershed divide) and SIERRA (east of the main watershed divide) COUNTIES:

| | Rates | Fringes |
|-------------------------|----------|---------|
| ELECTRICIAN..... | \$ 40.50 | |
| 17.38 | | |
| ----- | | |
| ELEC0551-004 06/01/2018 | | |

MARIN AND SONOMA COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| ELECTRICIAN..... | \$ 48.40 | |
| 22.66 | | |
| ----- | | |
| ELEC0551-005 12/01/2018 | | |

MARIN & SONOMA COUNTIES

| | Rates | Fringes |
|------------------------|----------|---------|
| Sound & Communications | | |
| Installer..... | \$ 38.42 | 20.11 |
| Technician..... | \$ 44.18 | 20.29 |

SCOPE OF WORK INCLUDES- SOUND & VOICE TRANSMISSION (Music, Intercom, Nurse Call, Telephone); FIRE ALARM SYSTEMS [excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs], TELEVISION & VIDEO SYSTEMS, SECURITY SYSTEMS, COMMUNICATIONS SYSTEMS that transmit or receive information and/or control systems that are intrinsic to the above.

EXCLUDES- Excludes all other data systems or multiple systems which include control function or power supply; excludes installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having Greenstone Rd at Slate Creek Bridge Replacement **CIP No. 77137, Contract No. 3605** March 5, 2019

floors located more than 75' above the lowest floor level having building access); excludes energy management systems.

ELEC0659-006 01/01/2018

DEL NORTE, MODOC and SISKIYOU COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| ELECTRICIAN..... | \$ 33.94 | |
| 16.79 | | |
| ----- | | |
| ELEC0659-008 02/01/2018 | | |

DEL NORTE, MODOC & SISKIYOU COUNTIES

| | Rates | Fringes |
|---------------------------------------------------------|----------|---------|
| Line Construction | | |
| (1) Cable Splicer..... | \$ 57.94 | 18.27 |
| (2) Lineman, Pole Sprayer, Heavy Line Equipment Man.... | \$ 51.73 | |
| 18.02 | | |
| (3) Tree Trimmer..... | \$ 31.10 | 11.32 |
| (4) Line Equipment Man..... | \$ 51.73 | |
| 18.02 | | |
| (5) Powdermen, Jackhammermen..... | \$ 33.80 | |
| 13.35 | | |
| (6) Groundman..... | \$ 33.11 | 13.17 |

ELEC1245-004 06/01/2018

ALL COUNTIES EXCEPT DEL NORTE, MODOC & SISKIYOU

| | Rates | Fringes |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| LINE CONSTRUCTION | | |
| (1) Lineman; Cable splicer.. | \$ 56.79 | |
| 17.91 | | |
| (2) Equipment specialist (operates crawler tractors, commercial motor vehicles, backhoes, trenchers, cranes (50 tons and below), overhead & underground distribution line equipment)..... | \$ 45.36 | 16.74 |
| (3) Groundman..... | \$ 34.68 | 16.36 |
| (4) Powderman..... | \$ 49.55 | |
| 3%+17.65 | | |

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HOLIDAYS: New Year's Day, M.L. King Day,
 Memorial Day,
 Independence Day, Labor Day, Veterans Day,
 Thanksgiving Day
 and day after Thanksgiving, Christmas Day

 * ELEV0008-001 01/01/2019

| | Rates | Fringes |
|------------------------|----------|---------|
| ELEVATOR MECHANIC..... | \$ 67.56 | |
| 34.125+a+b | | |

FOOTNOTE:

PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.

PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

 ENGI0003-008 07/01/2017

| | Rates | Fringes |
|-----------------------------------------------------------------------------------------------------|----------|---------|
| Dredging: (DREDGING; CLAMSHELL & DIPPER DREDGING; HYDRAULIC SUCTION DREDGING:) | | |
| AREA 1: | | |
| (1) Leverman..... | \$ 44.77 | 31.25 |
| (2) Dredge Dozer; Heavy duty repairman..... | \$ 39.81 | 31.25 |
| (3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator..... | \$ 38.69 | 31.25 |
| (4) Bargeman; Deckhand; Fireman; Leveehand; Oiler.. | \$ 35.39 | |
| 31.25 | | |
| AREA 2: | | |
| (1) Leverman..... | \$ 46.77 | 31.25 |
| (2) Dredge Dozer; Heavy duty repairman..... | \$ 41.81 | 31.25 |
| (3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator..... | \$ 40.69 | 31.25 |
| (4) Bargeman; Deckhand; Fireman; Leveehand; Oiler.. | \$ 37.39 | |
| 31.25 | | |

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AREA DESCRIPTIONS

AREA 1: ALAMEDA,BUTTE, CONTRA
 COSTA, KINGS, MARIN, MERCED,
 NAPA, SACRAMENTO, SAN BENITO, SAN
 FRANCISCO, SAN JOAQUIN,
 SAN MATEO, SANTA CLARA, SANTA CRUZ,
 SOLANO, STANISLAUS,
 SUTTER, YOLO, AND YUBA COUNTIES

AREA 2: MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT
 BETWEEN AREA 1 AND AREA 2
 AS NOTED BELOW:

ALPINE COUNTY:
 Area 1: Northernmost part
 Area 2: Remainder

CALAVERAS COUNTY:
 Area 1: Remainder
 Area 2: Eastern part

COLUSA COUNTY:
 Area 1: Eastern part
 Area 2: Remainder

ELDORADO COUNTY:
 Area 1: North Central part
 Area 2: Remainder

FRESNO COUNTY:
 Area 1: Remainder
 Area 2: Eastern part

GLENN COUNTY:
 Area 1: Eastern part
 Area 2: Remainder

LASSEN COUNTY:
 Area 1: Western part along the Southern
 portion of border
 with Shasta County
 Area 2: Remainder

MADERA COUNTY:
 Area 1: Except Eastern part
 Area 2: Eastern part

MARIPOSA COUNTY
 Area 1: Except Eastern part
 Area 2: Eastern part

MONTERREY COUNTY
 Area 1: Except Southwestern part
 Area 2: Southwestern part

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NEVADA COUNTY:

Area 1: All but the Northern portion along the border of

Sierra County

Area 2: Remainder

PLACER COUNTY:

Area 1: All but the Central portion

Area 2: Remainder

PLUMAS COUNTY:

Area 1: Western portion

Area 2: Remainder

SHASTA COUNTY:

Area 1: All but the Northeastern corner

Area 2: Remainder

SIERRA COUNTY:

Area 1: Western part

Area 2: Remainder

SISKIYOU COUNTY:

Area 1: Central part

Area 2: Remainder

SONOMA COUNTY:

Area 1: All but the Northwestern corner

Area 2: Remainder

TEHAMA COUNTY:

Area 1: All but the Western border with Mendocino & Trinity Counties

Area 2: Remainder

TRINITY COUNTY:

Area 1: East Central part and the Northeastern border with

Shasta County

Area 2: Remainder

TUOLUMNE COUNTY:

Area 1: Except Eastern part

Area 2: Eastern part

ENGI0003-018 06/26/2017

"AREA 1" WAGE RATES ARE LISTED BELOW

"AREA 2" RECEIVES AN ADDITIONAL \$2.00 PER HOUR ABOVE AREA 1 RATES.

SEE AREA DEFINITIONS BELOW

Rates Fringes

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OPERATOR: Power Equipment (AREA 1:)

| | | |
|----------------|----------|-------|
| GROUP 1..... | \$ 44.67 | 30.39 |
| GROUP 2..... | \$ 43.14 | 30.39 |
| GROUP 3..... | \$ 41.66 | 30.39 |
| GROUP 4..... | \$ 40.28 | 30.39 |
| GROUP 5..... | \$ 39.01 | 30.39 |
| GROUP 6..... | \$ 37.69 | 30.39 |
| GROUP 7..... | \$ 36.55 | 30.39 |
| GROUP 8..... | \$ 35.41 | 30.39 |
| GROUP 8-A..... | \$ 33.20 | 30.39 |

OPERATOR: Power Equipment (Cranes and Attachments - AREA 1:)

| | | |
|------------------------|----------|-------|
| GROUP 1 | | |
| Cranes..... | \$ 46.30 | 30.39 |
| Oiler..... | \$ 36.63 | 30.39 |
| Truck crane oiler..... | \$ 39.20 | 30.39 |
| GROUP 2 | | |
| Cranes..... | \$ 43.79 | 30.39 |
| Oiler..... | \$ 36.36 | 30.39 |
| Truck crane oiler..... | \$ 38.98 | 30.39 |
| GROUP 3 | | |
| Cranes..... | \$ 42.05 | 30.39 |
| Hydraulic..... | \$ 38.32 | 30.39 |
| Oiler..... | \$ 36.14 | 30.39 |
| Truck Crane Oiler..... | \$ 38.71 | 30.39 |
| GROUP 4 | | |
| Cranes..... | \$ 39.01 | 30.39 |

OPERATOR: Power Equipment (Piledriving - AREA 1:)

| | | |
|------------------------|----------|-------|
| GROUP 1 | | |
| Lifting devices..... | \$ 45.89 | 30.39 |
| Oiler..... | \$ 36.63 | 30.39 |
| Truck crane oiler..... | \$ 39.20 | 30.39 |
| GROUP 2 | | |
| Lifting devices..... | \$ 44.07 | 30.39 |
| Oiler..... | \$ 36.36 | 30.39 |
| Truck Crane Oiler..... | \$ 38.98 | 30.39 |
| GROUP 3 | | |
| Lifting devices..... | \$ 42.39 | 30.39 |
| Oiler..... | \$ 36.14 | 30.39 |
| Truck Crane Oiler..... | \$ 38.71 | 30.39 |
| GROUP 4 | | |
| Lifting devices..... | \$ 40.62 | 30.39 |
| GROUP 5 | | |
| Lifting devices..... | \$ 39.32 | 30.39 |
| GROUP 6 | | |
| Lifting devices..... | \$ 37.98 | 30.39 |

OPERATOR: Power Equipment (Steel Erection - AREA 1:)

| | | |
|------------------------|----------|-------|
| GROUP 1 | | |
| Cranes..... | \$ 46.30 | 30.39 |
| Oiler..... | \$ 36.63 | 30.39 |
| Truck Crane Oiler..... | \$ 39.20 | 30.39 |
| GROUP 2 | | |
| Cranes..... | \$ 43.79 | 30.39 |
| Oiler..... | \$ 36.36 | 30.39 |

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| | | |
|-------------------------------------------------------------------------|----------|-------|
| Truck Crane Oiler..... | \$ 38.98 | 30.39 |
| GROUP 3 | | |
| Cranes..... | \$ 42.05 | 30.39 |
| Hydraulic..... | \$ 38.32 | 30.39 |
| Oiler..... | \$ 36.14 | 30.39 |
| Truck Crane Oiler..... | \$ 38.71 | 30.39 |
| GROUP 4 | | |
| Cranes..... | \$ 39.01 | 30.39 |
| GROUP 5 | | |
| Cranes..... | \$ 35.13 | 30.39 |
| OPERATOR: Power Equipment (Tunnel and Underground Work - AREA 1:) | | |
| SHAFTS, STOPES, RAISES: | | |
| GROUP 1..... | \$ 40.77 | 30.39 |
| GROUP 1-A..... | \$ 43.24 | 30.39 |
| GROUP 2..... | \$ 39.51 | 30.39 |
| GROUP 3..... | \$ 38.18 | 30.39 |
| GROUP 4..... | \$ 37.04 | 30.39 |
| GROUP 5..... | \$ 35.90 | 30.39 |
| UNDERGROUND: | | |
| GROUP 1..... | \$ 40.67 | 30.39 |
| GROUP 1-A..... | \$ 43.14 | 30.39 |
| GROUP 2..... | \$ 39.41 | 30.39 |
| GROUP 3..... | \$ 38.08 | 30.39 |
| GROUP 4..... | \$ 36.94 | 30.39 |
| GROUP 5..... | \$ 35.80 | 30.39 |

FOOTNOTE: Work suspended by ropes or cables, or work on a Yo-Yo Cat: \$.60 per hour additional.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Operator of helicopter (when used in erection work); Hydraulic excavator, 7 cu. yds. and over; Power shovels, over 7 cu. yds.

GROUP 2: Highline cableway; Hydraulic excavator, 3-1/2 cu. yds. up to 7 cu. yds.; Licensed construction work boat operator, on site; Power blade operator (finish); Power shovels, over 1 cu. yd. up to and including 7 cu. yds. m.r.c.

GROUP 3: Asphalt milling machine; Cable backhoe; Combination backhoe and loader over 3/4 cu. yds.; Continuous flight tie back machine assistant to engineer or mechanic; Crane

mounted continuous flight tie back machine, tonnage to apply; Crane mounted drill attachment, tonnage to apply; Dozer, slope brd; Gradall; Hydraulic excavator, up to 3 1/2 cu. yds.; Loader 4 cu. yds. and over; Long reach excavator; Multiple engine scraper (when used as push pull); Power shovels, up to and including 1 cu. yd.; Pre-stress wire wrapping machine; Side boom cat, 572 or larger; Track loader 4 cu. yds. and over; Wheel excavator (up to and including 750 cu. yds. per hour)

GROUP 4: Asphalt plant engineer/box person; Chicago boom; Combination backhoe and loader up to and including 3/4 cu. yd.; Concrete batch plant (wet or dry); Dozer and/or push cat; Pull- type elevating loader; Gradesetter, grade checker (GPS, mechanical or otherwise); Grooving and grinding machine; Heading shield operator; Heavy-duty drilling equipment, Hughes, LDH, Watson 3000 or similar; Heavy-duty repairperson and/or welder; Lime spreader; Loader under 4 cu. yds.; Lubrication and service engineer (mobile and grease rack); Mechanical finishers or spreader machine (asphalt, Barber-Greene and similar); Miller Formless M-9000 slope paver or similar; Portable crushing and screening plants; Power blade support; Roller operator, asphalt; Rubber-tired scraper, self-loading (paddle-wheels, etc.); Rubber-tired earthmoving equipment (scrapers); Slip form paver (concrete); Small tractor with drag; Soil stabilizer (P & H or equal); Spider plow and spider puller; Tubex pile rig; Unlicensed construction work boat operator, on site; Timber skidder; Track loader up to 4 yds.; Tractor-drawn scraper; Tractor, compressor drill

combination; Welder; Woods-Mixer (and other similar Pugmill equipment)

GROUP 5: Cast-in-place pipe laying machine; Combination slusher and motor operator; Concrete conveyor or concrete pump, truck or equipment mounted; Concrete conveyor, building site; Concrete pump or pumpcrete gun; Drilling equipment, Watson 2000, Texoma 700 or similar; Drilling and boring machinery, horizontal (not to apply to waterliners, wagon drills or jackhammers); Concrete mixer/all; Person and/or material hoist; Mechanical finishers (concrete) (Clary, Johnson, Bidwell Bridge Deck or similar types); Mechanical burm, curb and/or curb and gutter machine, concrete or asphalt); Mine or shaft hoist; Portable crusher; Power jumbo operator (setting slip-forms, etc., in tunnels); Screed (automatic or manual); Self-propelled compactor with dozer; Tractor with boom D6 or smaller; Trenching machine, maximum digging capacity over 5 ft. depth; Vermeer T-600B rock cutter or similar

GROUP 6: Armor-Coater (or similar); Ballast jack tamper; Boom- type backfilling machine; Assistant plant engineer; Bridge and/or gantry crane; Chemical grouting machine, truck-mounted; Chip spreading machine operator; Concrete saw (self-propelled unit on streets, highways, airports and canals); Deck engineer; Drilling equipment Texoma 600, Hughes 200 Series or similar up to and including 30 ft. m.r.c.; Drill doctor; Helicopter radio operator; Hydro-hammer or similar; Line master; Skidsteer loader, Bobcat larger than 743 series or similar (with attachments); Locomotive; Lull hi-lift or similar; Oiler, truck mounted equipment; Pavement breaker, truck-mounted,

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with compressor combination; Paving fabric installation and/or laying machine; Pipe bending machine (pipelines only); Pipe wrapping machine (tractor propelled and supported); Screed (except asphaltic concrete paving); Self-propelled pipeline wrapping machine; Tractor; Self-loading chipper; Concrete barrier moving machine

GROUP 7: Ballast regulator; Boom truck or dual-purpose A-frame truck, non-rotating - under 15 tons; Cary lift or similar; Combination slurry mixer and/or cleaner; Drilling equipment, 20 ft. and under m.r.c.; Firetender (hot plant); Grouting machine operator; Highline cableway signalperson; Stationary belt loader (Kolman or similar); Lift slab machine (Vagtborg and similar types); Maginnes internal full slab vibrator; Material hoist (1 drum); Mechanical trench shield; Pavement breaker with or without compressor combination); Pipe cleaning machine (tractor propelled and supported); Post driver; Roller (except asphalt); Chip Seal; Self-propelled automatically applied concrete curing machine (on streets, highways, airports and canals); Self-propelled compactor (without dozer); Signalperson; Slip-form pumps (lifting device for concrete forms); Tie spacer; Tower mobile; Trenching machine, maximum digging capacity up to and including 5 ft. depth; Truck-type loader

GROUP 8: Bit sharpener; Boiler tender; Box operator; Brakeperson; Combination mixer and compressor (shotcrete/gunite); Compressor operator; Deckhand; Fire tender; Forklift (under 20 ft.); Generator; Gunite/shotcrete equipment operator; Hydraulic monitor; Ken seal machine (or similar); Mixermobile; Oiler; Pump

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operator; Refrigeration plant; Reservoir-debris tug (self-propelled floating); Ross Carrier (construction site);

Rotomist operator; Self-propelled tape machine; Shuttlecar;

Self-propelled power sweeper operator (includes vacuum sweeper); Slusher operator; Surface heater; Switchperson;

Tar pot firetender; Tugger hoist, single drum; Vacuum cooling plant; Welding machine (powered other than by electricity)

GROUP 8-A: Elevator operator; Skidsteer loader-Bobcat 743 series or smaller, and similar (without attachments); Mini excavator under 25 H.P. (backhoe-trencher); Tub grinder wood chipper

ALL CRANES AND ATTACHMENTS

GROUP 1: Clamshell and dragline over 7 cu. yds.; Crane, over 100 tons; Derrick, over 100 tons; Derrick barge pedestal-mounted, over 100 tons; Self-propelled boom-type lifting device, over 100 tons

GROUP 2: Clamshell and dragline over 1 cu. yd. up to and including 7 cu. yds.; Crane, over 45 tons up to and including 100 tons; Derrick barge, 100 tons and under; Self-propelled boom-type lifting device, over 45 tons; Tower crane

GROUP 3: Clamshell and dragline up to and including 1 cu. yd.; Cranes 45 tons and under; Self-propelled boom-type lifting device 45 tons and under;

GROUP 4: Boom Truck or dual purpose A-frame truck, non-rotating over 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) over 15 tons; Truck-mounted rotating

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telescopic boom type lifting device, Manitex or similar (boom truck) - under 15 tons;

PILEDRIVERS

GROUP 1: Derrick barge pedestal mounted over 100 tons; Clamshell over 7 cu. yds.; Self-propelled boom-type lifting device over 100 tons; Truck crane or crawler, land or barge mounted over 100 tons

GROUP 2: Derrick barge pedestal mounted 45 tons to and including 100 tons; Clamshell up to and including 7 cu. yds.; Self-propelled boom-type lifting device over 45 tons; Truck crane or crawler, land or barge mounted, over 45 tons up to and including 100 tons; Fundex F-12 hydraulic pile rig

GROUP 3: Derrick barge pedestal mounted under 45 tons; Self-propelled boom-type lifting device 45 tons and under; Skid/scow piledriver, any tonnage; Truck crane or crawler, land or barge mounted 45 tons and under

GROUP 4: Assistant operator in lieu of assistant to engineer; Forklift, 10 tons and over; Heavy-duty repairperson/welder

GROUP 5: Deck engineer

GROUP 6: Deckhand; Fire tender

STEEL ERECTORS

GROUP 1: Crane over 100 tons; Derrick over 100 tons; Self-propelled boom-type lifting device over 100 tons

GROUP 2: Crane over 45 tons to 100 tons; Derrick under 100 tons; Self-propelled boom-type lifting device over 45 tons to 100 tons; Tower crane

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GROUP 3: Crane, 45 tons and under; Self-propelled boom-type lifting device, 45 tons and under

GROUP 4: Chicago boom; Forklift, 10 tons and over; Heavy-duty repair person/welder

GROUP 5: Boom cat

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TUNNEL AND UNDERGROUND WORK

GROUP 1-A: Tunnel bore machine operator, 20' diameter or more

GROUP 1: Heading shield operator; Heavy-duty repairperson; Mucking machine (rubber tired, rail or track type); Raised bore operator (tunnels); Tunnel mole bore operator

GROUP 2: Combination slusher and motor operator; Concrete pump or pumpcrete gun; Power jumbo operator

GROUP 3: Drill doctor; Mine or shaft hoist

GROUP 4: Combination slurry mixer cleaner; Grouting Machine operator; Motorman

GROUP 5: Bit Sharpener; Brakeman; Combination mixer and compressor (gunite); Compressor operator; Oiler; Pump operator; Slusher operator

AREA DESCRIPTIONS:

POWER EQUIPMENT OPERATORS, CRANES AND ATTACHMENTS, TUNNEL AND UNDERGROUND [These areas do not apply to Piledrivers and Steel Erectors]

AREA 1: ALPINE, AMADOR, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MARIN, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SOLANO, SONOMA, SUTTER, TEHAMA, TRINITY, YOLO, YUBA
AREA 2 - MODOC COUNTY
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THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

DEL NORTE COUNTY:
Area 1: Extreme Southwestern corner
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: All but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner

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Area 2: Remainder

TEHAMA COUNTY:

Area 1: All but the Western border with mendocino & Trinity Counties

Area 2: Remainder

TRINITY COUNTY:

Area 1: East Central part and the Northeast border with Shasta County

Area 2: Remainder

ENGI0003-019 07/26/2017

SEE AREA DESCRIPTIONS BELOW

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| OPERATOR: Power Equipment (LANDSCAPE WORK ONLY) | | |
| GROUP 1 | | |
| AREA 1..... | \$ 34.05 | 28.73 |
| AREA 2..... | \$ 36.05 | 28.73 |
| GROUP 2 | | |
| AREA 1..... | \$ 30.45 | 28.73 |
| AREA 2..... | \$ 32.45 | 28.73 |
| GROUP 3 | | |
| AREA 1..... | \$ 25.84 | 28.73 |
| AREA 2..... | \$ 27.84 | 28.73 |

GROUP DESCRIPTIONS:

GROUP 1: Landscape Finish Grade Operator: All finish grade work regardless of equipment used, and all equipment with a rating more than 65 HP.

GROUP 2: Landscape Operator up to 65 HP: All equipment with a manufacturer's rating of 65 HP or less except equipment covered by Group 1 or Group 3. The following equipment shall be included except when used for finish work as long as manufacturer's rating is 65 HP or less: A-Frame and Winch Truck, Backhoe, Forklift, Hydragraphic Seeder Machine, Roller, Rubber-Tired and Track Earthmoving Equipment, Skiploader, Straw Blowers, and Trencher 31 HP up to 65 HP.

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GROUP 3: Landscap Utility Operator: Small Rubber-Tired Tractor, Trencher Under 31 HP.

AREA DESCRIPTIONS:

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2 - MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:

Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:

Area 1: Except Eastern part
Area 2: Eastern part

COLUSA COUNTY:

Area 1: Eastern part
Area 2: Remainder

DEL NORTE COUNTY:

Area 1: Extreme Southwestern corner
Area 2: Remainder

ELDORADO COUNTY:

Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY

Area 1: Except Eastern part
Area 2: Eastern part

GLENN COUNTY:

Area 1: Eastern part
Area 2: Remainder

HUMBOLDT COUNTY:

Area 1: Except Eastern and Southwestern parts
Area 2: Remainder

LAKE COUNTY:

Area 1: Southern part
Area 2: Remainder

LASSEN COUNTY:

Area 1: Western part along the Southern portion of border

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with Shasta County
Area 2: Remainder

MADERA COUNTY
Area 1: Remainder
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Remainder
Area 2: Eastern part

MENDOCINO COUNTY:
Area 1: Central and Southeastern parts
Area 2: Remainder

MONTEREY COUNTY
Area 1: Remainder
Area 2: Southwestern part

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: All but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Remainder

TEHAMA COUNTY:
Area 1: All but the Western border with Mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeast border with Shasta County
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Area 2: Remainder

TULARE COUNTY;
Area 1: Remainder
Area 2: Eastern part

TUOLUMNE COUNTY:
Area 1: Remainder
Area 2: Eastern Part

* IRON0377-002 01/01/2019

| | Rates | Fringes |
|---------------------------------------------|----------|---------|
| Ironworkers: | | |
| Fence Erector..... | \$ 32.58 | 23.41 |
| Ornamental, Reinforcing and Structural..... | \$ 39.00 | 32.05 |

PREMIUM PAY:
\$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland, Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

\$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

\$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

LABO0067-001 12/01/2018

AREA "A" - MARIN COUNTY

AREA "B" - ALPINE, AMADOR, BUTTE
 COLUSA EL DORADO, GLENN,
 LASSEN, MODOC, NAPA, NEVADA, PLACER,
 PLUMAS, SACRAMENTO,
 SHASTA, SIERRA, SISKIYOU, SOLANO,
 SONOMA, SUTTER, TEHAMA,
 TRINITY, YOLO, AND YUBA COUNTIES

| | Rates | Fringes |
|-------------------------------|----------|---------|
| Asbestos Removal Laborer..... | \$ 24.00 | |
| 11.13 | | |
| LABORER (Lead Removal) | | |
| Marin County..... | \$ 31.81 | 22.71 |
| Remaining Counties..... | \$ 30.81 | |
| 22.71 | | |

 LABO0067-005 06/27/2017

AREA "A" - ALAMEDA, CONTRA COSTA,
 MARIN, SAN FRANCISCO, SAN
 MATEO AND SANTA CLARA COUNTIES

AREA "B" - ALPINE, AMADOR, BUTTE,
 CALAVERAS, COLUSA, DEL
 NORTE, EL DORADO, FRESNO, GLENN,
 HUMBOLDT, KINGS, LAKE, LASSEN,
 MADERA, MARIPOSA, MENDOCINO,
 MERCED, MODOC, MONTEREY, NAPA,
 NEVADA, PLACER, PLUMAS,
 SANCREMENTO, SAN BENITO, SAN
 JOAQUIN,
 SANTA CRUZ, SIERRA, SHASTA, SISKIYOU,
 SOLANO, SONOMA,
 STANISLAUS, TEHAMA, TRINITY, TULARE,
 TUOLUMNE, YOLO AND YUBA
 COUNTIES

| | Rates | Fringes |
|-------------------------------------------|----------|---------|
| LABORER (TRAFFIC CONTROL/LANE CLOSURE) | | |
| Escort Driver, Flag Person | | |
| Area A..... | \$ 29.54 | 22.17 |
| Area B..... | \$ 28.54 | 22.17 |
| Traffic Control Person I | | |
| Area A..... | \$ 29.84 | 22.17 |
| Area B..... | \$ 28.84 | 22.17 |
| Traffic Control Person II | | |
| Area A..... | \$ 27.34 | 22.17 |
| Area B..... | \$ 26.34 | 22.17 |

TRAFFIC CONTROL PERSON I: Layout of
 traffic control, crash
 cushions, construction area and roadside
 signage.

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TRAFFIC CONTROL PERSON II: Installation
 and removal of
 temporary/permanent signs, markers,
 delineators and crash
 cushions.

 LABO0185-002 07/01/2018

ALPINE, AMADOR, BUTTE, COLUSA, EL
 DORADO, GLENN, LASSEN, MODOC,
 NEVADA, PLACER, PLUMAS, SACRAMENTO,
 SHASTA, SIERRA, SISKIYOU,
 SUTTER, TEHAMA, TRINITY, YOLO AND
 YUBA COUNTIES

Rates Fringes

| | | |
|-------------------------|----------|--|
| LABORER | | |
| Mason Tender-Brick..... | \$ 31.20 | |
| 22.20 | | |

 LABO0185-005 06/25/2018

ALPINE, AMADOR, BUTTE, COLUSA, EL
 DORADO, GLENN, LASSEN, MODOC,
 NEVADA, PLACER, PLUMAS, SACRAMENTO,
 SHASTA, SIERRA, SISKIYOU,
 SUTTER, TEHAMA, TRINITY, YOLO AND
 YUBA COUNTIES

Rates Fringes

| | | |
|----------------------------|----------|-------|
| Tunnel and Shaft Laborers: | | |
| GROUP 1..... | \$ 37.82 | 24.11 |
| GROUP 2..... | \$ 37.59 | 24.11 |
| GROUP 3..... | \$ 37.34 | 24.11 |
| GROUP 4..... | \$ 36.89 | 24.11 |
| GROUP 5..... | \$ 36.35 | 24.11 |
| Shotcrete Specialist..... | \$ 38.34 | |
| 24.11 | | |

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen;
 Gunite and shotcrete
 nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below
 actual or
 excavated ground level)

GROUP 3: Bit grinder; Blaster, driller,
 powdermen, heading;
 Cherry pickermen - where car is lifted;
 Concrete finisher

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in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

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ALPINE, AMADOR, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MODOC, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHIESTA, SIERRA, SISKIYOU, SUTTER, TEHAMA, TRINITY, YOLO, YUBA COUNTIES

Rates Fringes

| | | |
|-------------------------------------------------|----------|-------|
| LABORER (CONSTRUCTION CRAFT LABORERS - AREA B:) | | |
| Construction Specialist | | |
| Group..... | \$ 30.49 | 23.20 |
| GROUP 1..... | \$ 29.79 | 23.20 |
| GROUP 1-a..... | \$ 30.01 | 23.20 |
| GROUP 1-c..... | \$ 30.01 | 23.20 |
| GROUP 1-e..... | \$ 30.34 | 23.20 |
| GROUP 1-f..... | \$ 30.37 | 23.20 |
| GROUP 2..... | \$ 29.64 | 23.20 |
| GROUP 3..... | \$ 29.54 | 23.20 |
| GROUP 4..... | \$ 23.23 | 23.20 |

See groups 1-b and 1-d under laborer classifications.

LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA B:)

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| | | |
|------------------------------|----------|-------|
| (1) New Construction..... | \$ 29.54 | |
| 23.20 | | |
| (2) Establishment Warranty | | |
| Period..... | \$ 23.23 | 23.20 |
| LABORER (GUNITE - AREA B:) | | |
| GROUP 1..... | \$ 29.75 | 22.31 |
| GROUP 2..... | \$ 29.25 | 22.31 |
| GROUP 3..... | \$ 28.66 | 22.31 |
| GROUP 4..... | \$ 28.54 | 22.31 |
| LABORER (WRECKING - AREA B:) | | |
| GROUP 1..... | \$ 29.79 | 23.20 |
| GROUP 2..... | \$ 29.64 | 23.20 |

FOOTNOTES:
 Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive \$0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP:
 Asphalt ironer and raker;
 Chainsaw; Laser beam in connection with laborers' work;
 Cast-in- place manhole form setter; Pressure pipelayer;
 Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill;
 Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement;
 Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter;
 Dri-pak-it machine; Faller, logloader and bucket; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter,

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aligner, by any method; High pressure blow pipe (1-1/2" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types

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regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive \$4.00 per day above Group 1 wage rates. "Sewer cleaner" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shall receive \$5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive \$.25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing

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from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work);

Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew;

High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete

construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not

listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher;

Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter);

Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification

"material cleaner" is to be utilized under the following conditions:

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A: at demolition site for the salvage of the material.

B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.

C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of "form stripping, cleaning and oiling and moving to the next point of erection".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunitite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

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| | Rates | Fringes |
|-----------------------|----------|---------|
| Plasterer tender..... | \$ 32.02 | 23.00 |

Work on a swing stage scaffold: \$1.00 per hour additional.

LABO0261-002 06/25/2018

MARIN COUNTY

| | Rates | Fringes |
|-------------------------------|-------|---------|
| LABORER (TRAFFIC CONTROL/LANE | | |

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CLOSURE)
 Escort Driver, Flag Person..\$ 30.54
 23.65
 Traffic Control Person I...\$ 30.84
 23.65
 Traffic Control Person II...\$ 28.34
 23.65

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0261-004 06/25/2018

MARIN COUNTY

| | Rates | Fringes |
|----------------------------|----------|---------|
| Tunnel and Shaft Laborers: | | |
| GROUP 1..... | \$ 37.82 | 24.11 |
| GROUP 2..... | \$ 37.59 | 24.11 |
| GROUP 3..... | \$ 37.34 | 24.11 |
| GROUP 4..... | \$ 36.89 | 24.11 |
| GROUP 5..... | \$ 36.35 | 24.11 |
| Shotcrete Specialist..... | \$ 38.34 | |
| | | 24.11 |

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlelemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Greenstone Rd at Slate Creek Bridge Replacement
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Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0261-007 07/01/2018

MARIN AND NAPA COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| LABORER | | |
| Mason Tender-Brick..... | \$ 32.45 | |
| | | 22.20 |

LABO0261-010 06/25/2018

MARIN COUNTY

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| LABORER (CONSTRUCTION CRAFT LABORERS - AREA A:) | | |
| Construction Specialist Group..... | \$ 31.49 | 23.20 |
| GROUP 1..... | \$ 30.79 | 23.20 |
| GROUP 1-a..... | \$ 31.01 | 23.20 |
| GROUP 1-c..... | \$ 30.84 | 23.20 |
| GROUP 1-e..... | \$ 31.34 | 23.20 |
| GROUP 1-f..... | \$ 31.37 | 23.20 |
| GROUP 2..... | \$ 30.64 | 23.20 |
| GROUP 3..... | \$ 30.54 | 23.20 |
| GROUP 4..... | \$ 24.23 | 23.20 |

See groups 1-b and 1-d under laborer classifications.

| | | |
|-------------------------------------------------------------------|----------|-------|
| LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA A:) | | |
| (1) New Construction..... | \$ 30.54 | |
| | | 23.20 |
| (2) Establishment Warranty Period..... | \$ 24.23 | 23.20 |

| | | |
|----------------------------|----------|-------|
| LABORER (GUNITE - AREA A:) | | |
| GROUP 1..... | \$ 30.75 | 22.31 |
| GROUP 2..... | \$ 30.25 | 22.31 |

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| | | |
|------------------------------|----------|-------|
| GROUP 3..... | \$ 29.66 | 22.31 |
| GROUP 4..... | \$ 29.54 | 22.31 |
| LABORER (WRECKING - AREA A:) | | |
| GROUP 1..... | \$ 30.79 | 23.20 |
| GROUP 2..... | \$ 30.64 | 23.20 |

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive \$0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP:

Asphalt ironer and raker;
 Chainsaw; Laser beam in connection with laborers' work;
 Cast-in- place manhole form setter; Pressure pipelayer;
 Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill;
 Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement;
 Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter;
 Dri-pak-it machine; Faller, logloader and buckler; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches;

Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for

such loading and placing; High scalers (including drilling of same); Tree toppler; Bit grinder

GROUP 1-b: Sewer cleaners shall receive \$4.00 per day above

Group 1 wage rates. "Sewer cleaner" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shall receive \$5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive \$.25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with gunniting or shotcrete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification "material cleaner" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.

C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of "form stripping, cleaning and oiling and moving to the next point of erection".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

 LABO0261-015 07/01/2018

| | Rates | Fringes |
|-----------------------|----------|---------|
| Plasterer tender..... | \$ 32.02 | 23.00 |

Work on a swing stage scaffold: \$1.00 per hour additional.

 LABO0324-004 06/25/2018

NAPA, SOLANO, AND SONOMA, COUNTIES

| | Rates | Fringes |
|-----------------------------------------------|----------|---------|
| LABORER (TRAFFIC CONTROL/LANE CLOSURE) | | |
| Escort Driver, Flag Person.. | \$ 29.54 | |
| | 23.65 | |
| Traffic Control Person I.... | \$ 29.84 | |
| | 23.65 | |

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Traffic Control Person II...\$ 27.34
 23.65

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

 LABO0324-008 06/25/2018

NAPA, SOLANO, AND SONOMA COUNTIES

| | Rates | Fringes |
|-----------------------------------|----------|---------|
| Tunnel and Shaft Laborers: | | |
| GROUP 1..... | \$ 37.82 | 24.11 |
| GROUP 2..... | \$ 37.59 | 24.11 |
| GROUP 3..... | \$ 37.34 | 24.11 |
| GROUP 4..... | \$ 36.89 | 24.11 |
| GROUP 5..... | \$ 36.35 | 24.11 |
| Shotcrete Specialist..... | \$ 38.34 | |
| | 24.11 | |

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlelemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute

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materials therefore); Tugger (for tunnel laborer work);
Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

GROUP 2.....\$ 29.64 23.20

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive \$0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABO0324-010 07/01/2018

SOLANO AND SONOMA COUNTIES

| | Rates | Fringes |
|-------------------------|----------|---------|
| LABORER | | |
| Mason Tender-Brick..... | \$ 31.45 | |
| 22.20 | | |

LABO0324-013 06/25/2018

NAPA, SOLANO, AND SONOMA COUNTIES

| | Rates | Fringes |
|-------------------------------------------------|----------|---------|
| LABORER (CONSTRUCTION CRAFT LABORERS - AREA B:) | | |
| Construction Specialist | | |
| Group..... | \$ 30.49 | 23.20 |
| GROUP 1..... | \$ 29.79 | 23.20 |
| GROUP 1-a..... | \$ 30.01 | 23.20 |
| GROUP 1-c..... | \$ 29.84 | 23.20 |
| GROUP 1-e..... | \$ 30.34 | 23.20 |
| GROUP 1-f..... | \$ 29.37 | 23.20 |
| GROUP 2..... | \$ 29.64 | 23.20 |
| GROUP 3..... | \$ 29.54 | 23.20 |
| GROUP 4..... | \$ 23.23 | 23.20 |

See groups 1-b and 1-d under laborer classifications.

LABORER (GARDENERS, HORTICULTURAL & LANDSCAPE LABORERS - AREA B:)

| | | |
|----------------------------|----------|-------|
| (1) New Construction..... | \$ 29.54 | |
| 23.20 | | |
| (2) Establishment Warranty | | |
| Period..... | \$ 23.23 | 23.20 |

| | | |
|----------------------------|----------|-------|
| LABORER (GUNITE - AREA B:) | | |
| GROUP 1..... | \$ 29.75 | 22.31 |
| GROUP 2..... | \$ 29.25 | 22.31 |
| GROUP 3..... | \$ 28.66 | 22.31 |
| GROUP 4..... | \$ 28.54 | 22.31 |

| | | |
|------------------------------|----------|-------|
| LABORER (WRECKING - AREA B:) | | |
| GROUP 1..... | \$ 29.79 | 23.20 |

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LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP:

Asphalt ironer and raker;
Chainsaw; Laser beam in connection with laborers' work;
Cast-in-place manhole form setter; Pressure pipelayer;
Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill;
Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types);

Barko, Wacker and similar type tampers; Buggymobile;
Caulker, bander, pipewrapper, conduit layer, plastic pipelayer;
Certified hazardous waste worker including Lead Abatement;
Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter;
Dri-pak-it machine; Faller, logloader and bucket; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches;
Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic

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and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive \$4.00 per day above Group 1 wage rates. "Sewer cleaner" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shall receive \$5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive \$.25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work);

Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification "material cleaner" is to be utilized under the following conditions:
 A: at demolition site for the salvage of the material.
 B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
 C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of "form stripping, cleaning and oiling and moving to the next point of erection".

 GUNITE LABORER CLASSIFICATIONS

- GROUP 1: Structural Nozzleman
- GROUP 2: Nozzleman, Gunman, Potman, Groundman
- GROUP 3: Reboundman
- GROUP 4: Gunite laborer

 WRECKING WORK LABORER CLASSIFICATIONS

- GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)
- GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

 LABO0324-019 07/01/2018

| | Rates | Fringes |
|-------------------------------------------------------------|----------|---------|
| Plasterer tender..... | \$ 32.02 | 23.00 |
| Work on a swing stage scaffold: \$1.00 per hour additional. | | |

 PAIN0016-004 01/01/2018

MARIN, NAPA, SOLANO & SONOMA COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| Painters:..... | \$ 40.62 | 23.83 |

PREMIUMS:
 EXOTIC MATERIALS - \$0.75 additional per hour.
 SPRAY WORK: - \$0.50 additional per hour.
 INDUSTRIAL PAINTING - \$0.25 additional per hour
 [Work on industrial buildings used for the manufacture and

processing of goods for sale or service; steel construction (bridges), stacks, towers, tanks, and similar structures]

HIGH WORK:
 over 50 feet - \$2.00 per hour additional
 100 to 180 feet - \$4.00 per hour additional
 Over 180 feet - \$6.00 per hour additional

 PAIN0016-005 01/01/2018

ALPINE, BUTTE, COLUSA, EL DORADO (west of the Sierra Nevada Mountains), GLENN, LASSEN (west of Hwy. 395, excluding Honey Lake); MARIN, MODOC, NAPA, NEVADA (west of the Sierra Nevada Mountains), PLACER (west of the Sierra Nevada Mountains), PLUMAS, SACRAMENTO, SHASTA, SIERRA (west of the Sierra Nevada Mountains), SISKIYOU, SOLANO, SONOMA, SUTTER, TEHAMA, TRINITY, YOLO AND YUBA COUNTIES

Rates Fringes

DRYWALL FINISHER/TAPER.....\$ 41.03
 25.34

 PAIN0016-007 01/01/2018

ALPINE, AMADOR, BUTTE, COLUSA. EL DORADO (west of the Sierra Nevada Mountains), GLENN, LASSEN (west of Highway 395, excluding Honey Lake), MODOC, NEVADA (west of the Sierra Nevada Mountains), PLACER (west of the Sierra Nevada Mountains), PLUMAS, SACRAMENTO, SHASTA, SIERRA (west of the Sierra Nevada Mountains), SISKIYOU, SUTTER, TEHAMA, TRINITY, YOLO & YUBA COUNTIES

Rates Fringes

Painters:.....\$ 32.91 19.26

SPRAY/SANDBLAST: \$0.50 additional per hour.
 EXOTIC MATERIALS: \$1.00 additional per hour.
 HIGH TIME: Over 50 ft above ground or water level \$2.00

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additional per hour. 100 to 180 ft above ground or water level \$4.00 additional per hour. Over 180 ft above ground or water level \$6.00 additional per hour.

 PAIN0016-008 01/01/2018

MARIN, NAPA, SOLANO AND SONOMA COUNTIES

Rates Fringes

SOFT FLOOR LAYER.....\$ 48.00
 26.03

 PAIN0169-004 07/01/2018

MARIN , NAPA & SONOMA COUNTIES; SOLANO COUNTY (west of a line defined as follows: Hwy. 80 corridor beginning at the City of Fairfield, including Travis Air Force Base and Suisun City; going north of Manakas Corner Rd., continue north on Suisun Valley Rd. to the Napa County line; Hwy. 80 corridor south on Grizzly Island Rd. to the Grizzly Island Management area)

Rates Fringes

GLAZIER.....\$ 49.13 28.09

 * PAIN0567-001 07/01/2018

EL DORADO COUNTY (east of the Sierra Nevada Mountains); LASSEN COUNTY (east of Highway 395, beginning at Stacey and including Honey Lake); NEVADA COUNTY (east of the Sierra Nevada Mountains); PLACER COUNTY (east of the Sierra Nevada Mountains); AND SIERRA COUNTY (east of the Sierra Nevada Mountains)

Rates Fringes

Painters:
 Brush and Roller.....\$ 26.70 13.04
 Spray Painter & Paperhanger.\$ 28.04
 13.04

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PREMIUMS:
 Special Coatings (Brush), and Sandblasting = \$0.50/hr
 Special Coatings (Spray), and Steeplejack = \$1.00/hr
 Special Coating Spray Steel = \$1.25/hr
 Swing Stage = \$2.00/hr

*A special coating is a coating that requires the mixing of 2 or more products.

 PAIN0567-007 07/01/2018

EL DORADO COUNTY (east of the Sierra Nevada Mountains); LASSEN COUNTY (east of Highway 395, beginning at Stacey and including Honey Lake); NEVADA COUNTY (east of the Sierra Nevada Mountains); PLACER COUNTY (east of the Sierra Nevada Mountains) AND SIERRA COUNTY (east of the Sierra Nevada Mountains)

| | Rates | Fringes |
|-----------------------|----------|---------|
| SOFT FLOOR LAYER..... | \$ 29.10 | |
| 13.14 | | |

 PAIN0567-010 07/01/2018

EL DORADO COUNTY (east of the Sierra Nevada Mountains); LASSEN COUNTY (east of Highway 395, beginning at Stacey and including Honey Lake); NEVADA COUNTY (east of the Sierra Nevada Mountains); PLACER COUNTY (east of the Sierra Nevada Mountains); AND SIERRA COUNTY (east of the Sierra Nevada Mountains)

| | Rates | Fringes |
|----------------------------------------------------------------|----------|---------|
| Drywall | | |
| (1) Taper..... | \$ 31.82 | 13.04 |
| (2) Steeplejack - Taper, over 40 ft with open space below..... | \$ 33.32 | 13.04 |

 PAIN0767-004 07/01/2018

ALPINE, AMADOR, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MODOC, Greenstone Rd at Slate Creek Bridge Replacement
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NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SOLANO (Remainder), SUTTER, TEHAMA, TRINITY, YOLO, YUBA

| | Rates | Fringes |
|--------------|----------|---------|
| GLAZIER..... | \$ 37.57 | 28.30 |

PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

Employee required to wear a body harness shall receive \$1.50 per hour above the basic hourly rate at any elevation.

 PAIN1176-001 01/01/2017

HIGHWAY IMPROVEMENT

| | Rates | Fringes |
|---------------------------------------|----------|---------|
| Parking Lot Striping/Highway Marking: | | |
| GROUP 1..... | \$ 34.41 | 16.31 |
| GROUP 2..... | \$ 29.25 | 16.31 |
| GROUP 3..... | \$ 29.59 | 16.31 |

CLASSIFICATIONS

GROUP 1: Striper: Layout and application of painted traffic stripes and marking; hot thermo plastic; tape, traffic stripes and markings

GROUP 2: Gamecourt & Playground Installer

GROUP 3: Protective Coating, Pavement Sealing

 PAIN1237-001 10/01/2018

ALPINE; COLUSA; EL DORADO (west of the Sierra Nevada Mountains); GLENN; LASSEN (west of Highway 395, beginning at Stacey and including Honey Lake); MODOC; NEVADA (west of the Sierra Nevada Mountains); PLACER (west of the Sierra Nevada

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Mountains); PLUMAS; SACRAMENTO;
 SHASTA; SIERRA (west of the
 Sierra Nevada Mountains); SISKIYOU;
 SUTTER; TEHAMA; TRINITY;
 YOLO AND YUBA COUNTIES

| | Rates | Fringes |
|-----------------------|----------|---------|
| SOFT FLOOR LAYER..... | \$ 36.81 | |
| 21.51 | | |

 PLAS0300-003 07/01/2018

| | Rates | Fringes |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| PLASTERER | | |
| AREA 295: Alpine, Amador, Butte, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Solano, Sutter, Tehama, Trinity, Yolo & Yuba Counties..... | \$ 32.70 | |
| 31.68 | | |
| AREA 355: Marin..... | \$ 36.73 | |
| 31.68 | | |
| AREA 355: Napa & Sonoma Counties..... | \$ 32.70 | 31.68 |

 PLAS0300-005 07/01/2017

| | Rates | Fringes |
|-------------------------------------|-------|---------|
| CEMENT MASON/CONCRETE FINISHER...\$ | | |
| 33.49 23.67 | | |

 PLUM0038-002 07/01/2018

MARIN AND SONOMA COUNTIES

| | Rates | Fringes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------|
| PLUMBER (Plumber, Steamfitter, Refrigeration Fitter) | | |
| (1) Work on wooden frame structures 5 stories or less excluding high-rise buildings and commercial work such as hospitals, prisons, hotels, schools, casinos, wastewater treatment plants, and research facilities as well as refrigeration pipefitting, service and repair work - MARKET | | |

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| | |
|--------------------------|----------|
| RECOVERY RATE..... | \$ 72.00 |
| 41.94 | |
| (2) All other work - NEW | |
| CONSTRUCTION RATE..... | \$ 72.00 |
| 41.94 | |

 PLUM0038-006 07/01/2018

MARIN & SONOMA COUNTIES

| | Rates | Fringes |
|------------------------------------------------------------------|----------|---------|
| Landscape/Irrigation Fitter (Underground/Utility Fitter)..... | \$ 61.20 | |
| 30.17 | | |

 * PLUM0228-001 01/01/2019

BUTTE, COLUSA, GLENN, LASSEN, MODOC,
 PLUMAS, SHASTA, SIERRA,
 SISKIYOU, SUTTER, TEHAMA, TRINITY &
 YUBA COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| PLUMBER..... | \$ 40.00 | 31.89 |

 * PLUM0343-001 01/01/2019

NAPA AND SOLANO COUNTIES

| | Rates | Fringes |
|-----------------------|----------|---------|
| PLUMBER/PIPEFITTER | | |
| Light Commercial..... | \$ 30.85 | |
| 20.40 | | |
| All Other Work..... | \$ 51.00 | 38.50 |

DEFINITION OF LIGHT COMMERCIAL:

Work shall include strip shopping centers,
 office buildings,
 schools and other commercial structures which
 the total
 plumbing bid does not exceed Two Hundred
 and Fifty Thousand
 (\$250,000) and the total heating and cooling
 does not
 exceed Two Hundred Fifty Thousand
 (\$250,000); or Any
 projects bid in phases shall not qualify unless
 the total
 project is less than Two Hundred Fifty
 Thousand (\$250,000)
 for the plumbing bid; and Two Hundred Fifty
 Thousand
 (\$250,000) for the heating and cooling bid.
 Excluded are

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hospitals, jails, institutions and industrial projects, regardless size of the project

FOOTNOTES: While fitting galvanized material: \$.75 per hour additional. Work from trusses, temporary staging, unguarded structures 35' from the ground or water: \$.75 per hour additional. Work from swinging scaffolds, boatswains chairs or similar devices: \$.75 per hour additional.

 PLUM0350-001 08/01/2018

EL DORADO COUNTY (Lake Tahoe area only); NEVADA COUNTY (Lake Tahoe area only); AND PLACER COUNTY (Lake Tahoe area only)

| | Rates | Fringes |
|-------------------------|----------|---------|
| PLUMBER/PIPEFITTER..... | \$ 42.84 | |
| 13.81 | | |

 PLUM0355-001 07/01/2018

ALPINE, AMADOR, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MODOC, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SOLANO, SUTTER, TEHAMA, TRINITY, YOLO, AND YUBA COUNTIES

| | Rates | Fringes |
|---------------------------------------------------|----------|---------|
| Underground Utility Worker /Landscape Fitter..... | \$ 27.10 | 16.30 |

 * PLUM0442-003 01/01/2019

AMADOR (South of San Joaquin River) and ALPINE COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| PLUMBER..... | \$ 42.25 | 30.64 |

 PLUM0447-001 07/01/2017

AMADOR (north of San Joaquin River), EL DORADO (excluding Lake

Greenstone Rd at Slate Creek Bridge Replacement
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Tahoe area), NEVADA (excluding Lake Tahoe area); PLACER (excluding Lake Tahoe area), SACRAMENTO AND YOLO COUNTIES

| | Rates | Fringes |
|----------------------------|----------|---------|
| PLUMBER/PIPEFITTER | | |
| Journeyman..... | \$ 48.37 | 24.00 |
| Light Commercial Work..... | \$ 36.23 | |
| 17.72 | | |

ROOF0081-006 08/01/2018

MARIN, NAPA, SOLANO AND SONOMA COUNTIES

| | Rates | Fringes |
|-------------|----------|---------|
| Roofer..... | \$ 39.40 | 17.58 |

 ROOF0081-007 08/01/2018

ALPINE, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MODOC, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SUTTER, TEHAMA, TRINITY, YOLO, AND YUBA COUNTIES

| | Rates | Fringes |
|-------------|----------|---------|
| Roofer..... | \$ 36.57 | 18.23 |

 SFCA0483-003 07/01/2018

MARIN, NAPA, SOLANO AND SONOMA COUNTIES

| | Rates | Fringes |
|-----------------------------------------|----------|---------|
| SPRINKLER FITTER (Fire Sprinklers)..... | \$ 63.87 | 30.62 |

 SFCA0669-003 04/01/2017

ALPINE, BUTTE, COLUSA, EL DORADO, GLENN, LASSEN, MODOC, NEVADA, PLACER, PLUMAS, SACRAMENTO, SHASTA, SIERRA, SISKIYOU, SUTTER, TEHAMA, TRINITY, YOLO AND YUBA COUNTIES

Rates Fringes

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SPRINKLER FITTER.....\$ 37.20
15.84

SHEE0104-006 07/02/2018

MARIN, NAPA, SOLANO SONOMA & TRINITY
COUNTIES

Rates Fringes

Sheet Metal Worker
Mechanical Contracts
\$200,000 or less.....\$ 51.87 37.19
All other work.....\$ 59.11 38.54

SHEE0104-009 07/01/2018

AMADOR, COLUSA, EL DORADO, NEVADA,
PLACER, SACRAMENTO, SUTTER,
YOLO AND YUBA COUNTIES

Rates Fringes

SHEET METAL WORKER.....\$ 42.91
34.45

SHEE0104-010 07/01/2018

AIPINE COUNTY

Rates Fringes

SHEET METAL WORKER.....\$ 40.34
32.80

SHEE0104-011 07/01/2018

BUTTE, COLUSA, EL DORADO, GLENN,
LASSEN, MODOC, NEVADA, PLACER,
PLUMAS, SACRAMENTO, SHASTA, SIERRA,
SISKIYOU, SUTTER, TEHAMA,
YOLO AND YUBA COUNTIES

Rates Fringes

Sheet Metal Worker (Metal
decking and siding only).....\$ 39.93
32.70

SHEE0104-014 07/01/2017

MARIN, NAPA, SOLANO, SONOMA AND
TRINITY COUNTIES

Rates Fringes

SHEET METAL WORKER (Metal
Greenstone Rd at Slate Creek Bridge Replacement
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Decking and Siding only).....\$ 37.53
32.10

SHEE0104-019 07/01/2018

BUTTE, GLENN, LASSEN, MODOC, PLUMAS,
SHASTA, SIERRA, SISKIYOU
AND TEHAMA COUNTIES

Rates Fringes

SHEET METAL WORKER
Mechanical Jobs \$200,000 &
under.....\$ 32.21 32.29
Mechanical Jobs over
\$200,000.....\$ 42.91 34.43

TEAM0094-001 07/01/2018

Rates Fringes

Truck drivers:
GROUP 1.....\$ 31.68 27.86
GROUP 2.....\$ 31.98 27.86
GROUP 3.....\$ 32.28 27.86
GROUP 4.....\$ 32.63 27.86
GROUP 5.....\$ 32.98 27.86

FOOTNOTES:

Articulated dump truck; Bulk cement spreader
(with or without
auger); Dumpcrete truck; Skid truck (debris
box); Dry
pre-batch concrete mix trucks; Dumpster or
similar type;
Slurry truck: Use dump truck yardage rate.
Heater planer; Asphalt burner; Scarifier burner;
Industrial
lift truck (mechanical tailgate); Utility and clean-
up
truck: Use appropriate rate for the power unit or
the
equipment utilized.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Dump trucks, under 6 yds.; Single
unit flat rack (2-
axle unit); Nipper truck (when flat rack truck is
used
appropriate flat rack shall apply); Concrete
pump truck
(when flat rack truck is used appropriate flat
rack shall
apply); Concrete pump machine; Fork lift and
lift jitneys;

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Fuel and/or grease truck driver or fuel person;
Snow buggy;
Steam cleaning; Bus or personhaul driver;
Escort or pilot
car driver; Pickup truck; Teamster oiler/greaser
and/or
serviceperson; Hook tender (including loading
and
unloading); Team driver; Tool room attendant
(refineries)

GROUP 2: Dump trucks, 6 yds. and under 8
yds.; Transit
mixers, through 10 yds.; Water trucks, under
7,000 gals.;
Jetting trucks, under 7,000 gals.; Single-unit
flat rack
(3-axle unit); Highbed heavy duty transport;
Scissor truck;
Rubber-tired muck car (not self-loaded);
Rubber-tired truck
jumbo; Winch truck and "A" frame drivers;
Combination winch
truck with hoist; Road oil truck or bootperson;
Buggymobile; Ross, Hyster and similar straddle
carriers;
Small rubber-tired tractor

GROUP 3: Dump trucks, 8 yds. and including
24 yds.; Transit
mixers, over 10 yds.; Water trucks, 7,000 gals.
and over;
Jetting trucks, 7,000 gals. and over; Vacuum
trucks under
7500 gals. Trucks towing tilt bed or flat bed pull
trailers; Lowbed heavy duty transport; Heavy
duty transport
tiller person; Self- propelled street sweeper
with
self-contained refuse bin; Boom truck - hydro-
lift or
Swedish type extension or retracting crane;
P.B. or similar
type self-loading truck; Tire repairperson;
Combination
bootperson and road oiler; Dry distribution
truck (A
bootperson when employed on such
equipment, shall receive
the rate specified for the classification of road
oil
trucks or bootperson); Ammonia nitrate
distributor, driver
and mixer; Snow Go and/or plow

GROUP 4: Dump trucks, over 25 yds. and
under 65 yds.; Water
pulls - DW 10's, 20's, 21's and other similar
equipment
Greenstone Rd at Slate Creek Bridge Replacement
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when pulling Aqua/pak or water tank trailers;
Helicopter
pilots (when transporting men and materials);
Lowbed Heavy
Duty Transport up to including 7 axles;
DW10's, 20's, 21's
and other similar Cat type, Terra Cobra,
LeTourneau Pulls,
Tournorocker, Euclid and similar type
equipment when
pulling fuel and/or grease tank trailers or other
miscellaneous trailers; Vacuum Trucks 7500
gals and over
and truck repairman

GROUP 5: Dump trucks, 65 yds. and over;
Holland hauler; Low
bed Heavy Duty Transport over 7 axles

WELDERS - Receive rate prescribed for craft
performing
operation to which welding is incidental.

=====
=====
Note: Executive Order (EO) 13706, Establishing
Paid Sick Leave
for Federal Contractors applies to all contracts
subject to the
Davis-Bacon Act for which the contract is
awarded (and any
solicitation was issued) on or after January 1,
2017. If this
contract is covered by the EO, the contractor
must provide
employees with 1 hour of paid sick leave for
every 30 hours
they work, up to 56 hours of paid sick leave
each year.
Employees must be permitted to use paid sick
leave for their
own illness, injury or other health-related needs,
including
preventive care; to assist a family member (or
person who is
like family to the employee) who is ill, injured, or
has other
health-related needs, including preventive care;
or for reasons
resulting from, or to assist a family member (or
person who is
like family to the employee) who is a victim of,
domestic
violence, sexual assault, or stalking. Additional
information

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on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Greenstone Rd at Slate Creek Bridge Replacement
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Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date

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for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION
APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage
Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

COUNTY OF EL DORADO

PAYMENT BOND

(Section 3247, Civil Code)

Bond No. _____

WHEREAS, the County of El Dorado, a political subdivision of the State of California, hereafter referred to as "Obligee", has awarded to Contractor

_____ hereafter referred to as "Principal", a Contract for the Work described as follows:

GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT

CIP No. 77137, Contract No. 3605

WHEREAS, the State of California, acting through its Department of Transportation is hereafter referred to as "Additional Obligee", both Obligee and Additional Obligee collectively referred to as "Obligees";

AND, WHEREAS, said Principal is required to furnish a bond in connection with said Contract, guaranteeing the faithful performance thereof:

NOW, THEREFORE, we the undersigned Principal and Surety are held and firmly bound unto the Obligees, in the sum of _____ Dollars,

(\$ _____) to be paid to the Obligees, for which payment we bind ourselves, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH,

That if said Principal or its Subcontractors shall fail to pay any of the persons named in Civil Code Section 3181, or amounts due under the Unemployment Insurance Code with respect to Work or labor performed by such claimant, or any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the Principal and his Subcontractors pursuant to Section 18806 of the Revenue and Taxation Code, with respect to such Work and labor, that the Surety herein will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, the Surety will pay a reasonable attorney's fee to be fixed by the court.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

Dated: _____

Correspondence or Claims relating to this bond should be sent to the Surety at the following address:

| | |
|-------|------------------|
| _____ | _____ |
| | PRINCIPAL |
| _____ | _____ |
| | SURETY |
| _____ | _____ |
| | ATTORNEY-IN-FACT |

NOTE: Signatures of those executing for the Principal and for the Surety must be properly acknowledged, and a Power of Attorney attached for the Surety.

NOTARY ACKNOWLEDGMENTS ATTACHED

PRINCIPAL

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____,

(here insert name and title of the officer)

personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

SURETY

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____,

(here insert name and title of the officer)

personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

**COUNTY OF EL DORADO
PERFORMANCE BOND**

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS, that we _____

the Contractor in the Contract hereto annexed, as Principal, and _____

as Surety, are held firmly bound unto the County of El Dorado, a political subdivision of the State of California, hereinafter called the "Obligee" **and the State of California, acting through its Department of Transportation, hereafter referred to as "Additional Obligee"**, both Obligee and Additional Obligee collectively referred to as "Obligees"

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.

Signed, sealed and dated: _____

The condition of the above obligation is such 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 Obligees, necessary to perform and complete, and to perform and complete in a good and workmanlike manner, the Work of **CIP No. 77137, Contract No. 3605 for the Greenstone Rd at Slate Creek Bridge Replacement** project in strict conformity with the terms and conditions set forth in the Contract hereto annexed, then this obligation shall be null and void; otherwise this bond shall remain in full force and effect and the said Surety will complete the Contract Work under its own supervision, by Contract or otherwise, and pay all costs thereof for the balance due under terms of the Contract, 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 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.

In the event suit is brought upon this bond by the Obligees and judgment is recovered, the Surety shall pay all costs incurred by the Obligees in such suit, including a reasonable attorney's fee to be fixed by the court.

This guarantee shall insure the Obligees during the Work required by any Contract and for a period of one (1) year from the date of acceptance of the Work against faulty or improper materials or workmanship that may be discovered during that time.

No right of action shall accrue under this bond to or for the use of any person other than the Obligees named herein.

Dated: _____, 20_____.

Correspondence or Claims relating to this bond should be sent to the Surety at the following address:

PRINCIPAL

SURETY

ATTORNEY-IN-FACT

NOTE: Signatures of those executing for the Principal and the Surety must be properly acknowledged, and a Power of Attorney attached for the Surety.

NOTARY ACKNOWLEDGMENTS ATTACHED

PRINCIPAL

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____,

(here insert name and title of the officer)

personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

SURETY

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____,

(here insert name and title of the officer)

personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

COMPLETING BID IN PENCIL, ERASURES, OVERWRITES, AND USE OF CORRECTION FLUID OR TAPE ARE NOT ACCEPTABLE. BID PROPOSALS WITH PENCIL, ERASURES, OVERWRITES, OR USE OF CORRECTION FLUID OR TAPE WILL BE REJECTED. ALL CHANGES MUST BE LINED OUT AND CORRECTIONS INSERTED ADJACENT TO AND INITIALED BY THE BIDDER'S AUTHORIZED REPRESENTATIVE.

PROPOSAL

(to be submitted with Bidder's Security)

TO: COUNTY OF EL DORADO,
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION,

for the construction of the

**GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT
CIP No. 77137, CONTRACT No. 3605**

NAME OF BIDDER _____

MAILING ADDRESS _____

CITY, STATE, ZIP _____

PHYSICAL ADDRESS _____

(Please include even if Mailing Address used)

CITY, STATE, ZIP _____

TELEPHONE NO: AREA CODE () _____

FAX NO: AREA CODE () _____

EMAIL ADDRESS _____

The Work for which this Proposal is submitted is for the construction in accordance with these Contract Documents (including the payment of not less than the State general prevailing wage rates **or Federal minimum wage rates** set forth herein), the Project Plans described below, including any addenda thereto, the Contract annexed hereto, and also in accordance with the California Department of Transportation Standard Plans 2015, the Standard Specifications 2015, Revised Standard Specifications, standard drawings from the Design and Improvement Standards Manual of the County of El Dorado, revised March 8, 1994 including Resolutions 199-91 and 58-94 to adopt changes to the Design and Improvement Standards Manual; the Labor Surcharge and Equipment Rental Rates in effect on the date the Work is accomplished, and in accordance with the General Prevailing Wage rates. The Project Plans and Contract Documents for the Work to be done are entitled:

GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT

CIP No. 77137, CONTRACT No. 3605

Bids are to be submitted for the entire Work. The amount of the bid for comparison purposes will be the total of all the items.

The Bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for this purpose. In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item.

In case of discrepancy between the item price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

- (a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;
- (b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc., from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage wise the unit price or item total in the Community Development Services, Department of Transportation's Final Estimate of cost.

If this Proposal is accepted and the undersigned Bidder shall fail to enter into the Contract and furnish the two bonds in the sums required by the State Contract Act, with surety satisfaction to the County of El Dorado and submit escrow bid documents in accordance with the Special Provisions within ten (10) days, not including Saturdays, Sundays, and legal holidays, of the date of the letter notice from the County of El Dorado that the Contract has been awarded, the County of El Dorado may, at its option, determine that the Bidder has abandoned the Contract, and thereupon this Proposal and the acceptance thereof shall be null and void and the forfeiture of such security accompanying this Proposal shall operate and the same shall be the property of the County of El Dorado.

The undersigned, as Bidder, declares under penalty of perjury under the laws of the State of California that the only persons or parties interested in this Proposal, as principals, are those named herein; that this Proposal is made without collusion with any other person, firm, or corporation; that it has carefully examined the location of the proposed work, the annexed proposed form of Contract, and the Plans therein referred to; and that it proposes, and agrees if this Proposal is accepted, that it will contract with the County of El Dorado, in the form of the copy of the Draft Contract annexed hereto, to provide all necessary machinery, tools, apparatus, and other means of construction, and to do all the work and furnish all the materials specified in the Contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that it will take in full payment therefore the following item prices, to wit:

**PROPOSAL PAY ITEMS AND BID PRICE SCHEDULE
GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT
CIP NO. 77137, CONTRACT No. 3605**

| ITEM NO. | ITEM CODE | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|--------------------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 1 | 070030 | LEAD COMPLIANCE PLAN | LS | 1 | | |
| 2 | 070030A | FIRE SAFETY PLAN | LS | 1 | | |
| 3 | 072007A | EXCAVATION SAFETY | LS | 1 | | |
| 4 | 080050 | PROGRESS SCHEDULE (CRITICAL PATH METHOD) | LS | 1 | | |
| 5 | 100100 | DEVELOP WATER SUPPLY | LS | 1 | | |
| 6 | 120090 | CONSTRUCTION AREA SIGNS | LS | 1 | | |
| 7 | 120090A | CONSTRUCTION PROJECT INFORMATION SIGNS | LS | 1 | | |
| 8 | 120100 | TRAFFIC CONTROL SYSTEM | LS | 1 | | |
| 9 | 128651A | PORTABLE CHANGEABLE MESSAGE SIGN | SWD | 500 | | |
| 10 | 129000 | TEMPORARY RAILING (TYPE K) | LF | 60 | | |
| 11 | 130100 | JOB SITE MANAGEMENT | LS | 1 | | |
| 12 | 130300 | PREPARE STORM WATER POLLUTION PREVENTION PLAN | LS | 1 | | |
| 13 | 130310 | RAIN EVENT ACTION PLAN | EA | 5 | | |
| 14 | 130330 | STORM WATER ANNUAL REPORT | LS | 1 | | |
| 15 | 130580A | TEMPORARY WATER DIVERSION | LS | 1 | | |
| 16 | 131103 | WATER QUALITY SAMPLING AND ANALYSIS DAY | EA | 3 | | |
| 17 | 140003 | ASBESTOS COMPLIANCE PLAN | LS | 1 | | |
| 18 | 141000A | TEMPORARY FENCE (TYPE ESA) | LF | 1000 | | |
| 19 | 141103 | REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE) | LF | 20 | | |
| 20 | 149001A | PREPARE ASBESTOS DUST MITIGATION PLAN | LS | 1 | | |
| 21 | 170103 | CLEARING AND GRUBBING | LS | 1 | | |

| ITEM NO. | ITEM CODE | | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|---|---------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 22 | 170103A | | REMOVE TREE | EA | 81 | | |
| 23 | 190101 | F | ROADWAY EXCAVATION | CY | 332 | | |
| 24 | 192003 | F | STRUCTURE EXCAVATION (BRIDGE) | CY | 156 | | |
| 25 | 192035 | F | STRUCTURE EXCAVATION (ROCK) | CY | 58 | | |
| 26 | 193003 | F | STRUCTURE BACKFILL (BRIDGE) | CY | 134 | | |
| 27 | 198010 | F | IMPORTED BORROW | CY | 1650 | | |
| 28 | 210270A | | ROLLED EROSION CONTROL PRODUCT (NETTING, TYPE B) | SQFT | 985 | | |
| 29 | 210280A | | ROLLED EROSION CONTROL PRODUCT (BLANKET, TYPE B) | SQFT | 16,340 | | |
| 30 | 210430 | | HYDROSEED | SQFT | 17,325 | | |
| 31 | 260203 | | CLASS 2 AGGREGATE BASE (CY) | CY | 522 | | |
| 32 | 390132 | | HOT MIX ASPHALT (TYPE A) | TON | 689 | | |
| 33 | 398200 | | COLD PLANE ASPHALT CONCRETE PAVEMENT | SQYD | 79 | | |
| 34 | 510051 | F | STRUCTURAL CONCRETE, BRIDGE FOOTING | CY | 53 | | |
| 35 | 510053 | F | STRUCTURAL CONCRETE, BRIDGE | CY | 90 | | |
| 36 | 510054 | F | STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER) | CY | 82 | | |
| 37 | 519088 | P | JOINT SEAL (MR 1") | LF | 70 | | |
| 38 | 520102 | P | BAR REINFORCING STEEL (BRIDGE) | LB | 25,866 | | |
| 39 | 600097 | | BRIDGE REMOVAL | LS | 1 | | |
| 40 | 723080 | | ROCK SLOPE PROTECTION (60 LB, CLASS II, METHOD B) | CY | 122 | | |
| 41 | 729011 | | ROCK SLOPE PROTECTION FABRIC (CLASS 8) | SQYD | 244 | | |
| 42 | 782200 | | OBLITERATE SURFACING | SQYD | 725 | | |
| 43 | 800052 | | FENCE (TYPE WM, WOOD POST) | LF | 750 | | |
| 44 | 803040 | | REMOVE FENCE (TYPE WM) | LF | 655 | | |

| ITEM NO. | ITEM CODE | | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|--------------------------------------------|-----------|---|--------------------------------------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 45 | 810170A | | DELINEATOR (CLASS 1, TYPE E) | EA | 4 | | |
| 46 | 810180A | | DELINEATOR (CLASS 2, TYPE E) | EA | 14 | | |
| 47 | 810230 | | PAVEMENT MARKER (RETROREFLECTIVE) | EA | 60 | | |
| 48 | 820410 | | SALVAGE ROADSIDE SIGN | EA | 6 | | |
| 49 | 820590 | | RELOCATE ROADSIDE SIGN-ONE POST | EA | 3 | | |
| 50 | 839543 | P | TRANSITION RAILING (TYPE WB-31) | EA | 4 | | |
| 51 | 839585 | P | ALTERNATIVE FLARED TERMINAL SYSTEM | EA | 4 | | |
| 52 | 839740 | P | CALIFORNIA ST-10 BRIDGE RAIL | LF | 148 | | |
| 53 | 840502 | | THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) | LF | 2,103 | | |
| 54 | 999990 | | MOBILIZATION | LS | 1 | | |
| EID WATERLINE RELOCATION WORK ITEMS | | | | | | | |
| 55 | 770100A | P | 6-INCH DUCTILE IRON PIPE | LF | 75 | | |
| 56 | 770200A | P | 12-INCH DUCTILE IRON PIPE | LF | 598 | | |
| 57 | 770300A | P | 12-INCH TR-FLEX DUCTILE IRON PIPE | LF | 72 | | |
| 58 | 490590A | P | 22-INCH STEEL CASING | LF | 60 | | |
| 59 | 770400A | | CASING SAND | LS | 1 | | |
| 60 | 208590 | P | 6-INCH GATE VALVE | EA | 2 | | |
| 61 | 208590A | P | 12-INCH GATE VALVE | EA | 2 | | |
| 62 | 208635A | P | 2-INCH AIR RELEASE VALVE | EA | 2 | | |
| 63 | 208589A | P | 4-INCH BLOW OFF ASSEMBLY | EA | 1 | | |
| 64 | 770500A | | TIE-IN 'A' | LS | 1 | | |
| 65 | 770500B | | TIE-IN 'B' | LS | 1 | | |
| 66 | 770500C | | TIE-IN 'C' | LS | 1 | | |
| 67 | 770500D | | TIE-IN 'D' | LS | 1 | | |

| ITEM NO. | ITEM CODE | ITEM DESCRIPTION | UNIT OF MEASURE | ESTIMATED QUANTITY | UNIT PRICE (IN FIGURES) | ITEM TOTAL (IN FIGURES) |
|----------|-----------|------------------------------|-----------------|--------------------|-------------------------|-------------------------|
| 68 | 710114A | ABANDON EXISTING FACILITIES | LS | 1 | | |
| 69 | 610001A | HYDROSTATIC PRESSURE TESTING | LS | 1 | | |
| 70 | 770600A | DISINFECTION | LS | 1 | | |

(F) Final Pay Quantity
(P) Eligible for Partial Payment
(LS) Lump Sum

(NOTICE: Bidders failure to execute the questionnaires and statements contained in this proposal as required by applicable laws and regulations, or the determinations by County of El Dorado based upon those questionnaires and statements, may prohibit award of the subject Contract to the bidder.)

SUBCONTRACTOR LIST

The Bidder must list the name, address, license number, and DIR number of each subcontractor to whom the Bidder proposes to subcontract portions of the Work in excess of 0.5% of the total bid, as required by the Contract Documents. The Bidder must also list the Work portion to be performed by each subcontractor by listing the bid item number, bid item description, and portion of the Work to be performed by the subcontractor in the form of a percentage calculated by dividing the Work to be performed by the subcontractor by the respective bid item amount(s) (not by the total bid price).

| Firm Name Address City, State, Zip Code | Phone Fax | License No. DIR No. | Bid Item Number Bid Item Description | Percentage of Each Bid Item Subcontracted |
|-----------------------------------------------|--------------|------------------------|-----------------------------------------|-------------------------------------------------|
| <i>Name</i> | <i>Phone</i> | <i>License No.</i> | | |
| <i>Address</i> | | | | |
| <i>City, State, Zip Code</i> | <i>Fax</i> | <i>DIR No.</i> | | |
| <i>Name</i> | <i>Phone</i> | <i>License No.</i> | | |
| <i>Address</i> | | | | |
| <i>City, State, Zip Code</i> | <i>Fax</i> | <i>DIR No.</i> | | |
| <i>Name</i> | <i>Phone</i> | <i>License No.</i> | | |
| <i>Address</i> | | | | |
| <i>City, State, Zip Code</i> | <i>Fax</i> | <i>DIR No.</i> | | |
| <i>Name</i> | <i>Phone</i> | <i>License No.</i> | | |
| <i>Address</i> | | | | |
| <i>City, State, Zip Code</i> | <i>Fax</i> | <i>DIR No.</i> | | |

(THE BIDDER'S EXECUTION ON THE SIGNATURE PORTION OF THIS PROPOSAL SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATIONS WHICH ARE A PART OF THIS PROPOSAL)

EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

| | <u>Has</u> | <u>Has Not</u> |
|---------------------------------|------------|----------------|
| The Bidder _____ | _____ | _____ |
| Proposed Subcontractor(s) _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

hereby certifies the above information regarding participation in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, 11246, and 11375, and as supplemented by 41 CFR 60, and that, where required he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the Bidder hereby declares under penalty of perjury under the laws of the State of California that the Bidder has _____, has not _____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "Bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The Bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the Bidder, any officer of the Bidder, or any employee of the Bidder who has a proprietary interest in the Bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes _____ No _____

If the answer is yes, explain the circumstances in the following space.

Public Contract Code Section 10232 Statement

In conformance with Public Contract Code Section 10232, the Bidder, hereby states under penalty of perjury under the laws of the State of California, that no more than one final unappealable finding of contempt of court by a Federal Court has been issued against the Bidder within the immediately preceding two year period because of the Bidder's failure to comply with an order of a Federal Court which orders the Bidder to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

NONCOLLUSION AFFIDAVIT

(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the Bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the Contract of anyone interested in the proposed Contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

NOTE:

The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Section 2200 *et seq.*)

As required by California Public Contract Code Section 2204, I certify subject to penalty for perjury that: i) I am duly authorized to execute this certification on behalf of Bidder; and ii) the option checked below relating to my status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 *et seq.*) is true and correct:

Bidder is not:

(i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(ii) a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

The County has exempted Bidder from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the County will be unable to obtain the goods and/or services to be provided pursuant to the Agreement.

The amount of the contract payable to Bidder for the work does not exceed \$1,000,000.

Signed _____

Titled _____

Firm _____

Date _____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of \$250,000 or twice the contract amount, termination of the contract and/or ineligibility to bid on public contracts for three years.

**DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSION CERTIFICATION,
UNITED STATES DEPARTMENT OF TRANSPORTATION(USDOT) 2 CODE OF FEDERAL
REGULATIONS (CFR) 1200 FEDERAL AGENCY REGULATIONS FOR GRANTS AND
AGREEMENTS AND EXECUTIVE ORDER 12549**

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, or manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining Bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Bidder further agrees by submitting this Proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where any lower tier participant is unable to certify to this statement, it shall attach an explanation to its proposal to the prime contractor.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.
The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

NON-LOBBYING CERTIFICATION FOR FEDERAL-AID CONTRACTS

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (1) No federal or state appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any federal or state agency, a member of the State Legislature or United States Congress, an officer or employee of the Legislature or Congress, or an employee of a Member of the Legislature or Congress in connection with the awarding of any state or federal contract, including this Contract, the making of any federal grant, the making of any state or federal loan, the entering into of any cooperative contract, and the extension, continuation, renewal, amendment, or modification of any state or federal contract, grant, loan, or cooperative contract.
- (2) If any funds other than federal appropriated funds have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any federal agency, a member of Congress, an officer or employee of Congress or an employee of a member of Congress in connection with this Contract, grant, local, or cooperative contract, the Bidder shall complete and submit Standard Form-LLL, " Disclosure of Lobbying Activities," in accordance with the form instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Bidder also agrees by submitting its bid or Proposal that it shall require that the language of this certification be included in all of its subcontracts which exceed \$100,000 and that all such subcontractors shall certify and disclose accordingly. If the Bidder is awarded this Contract, it shall ensure that all subcontractors submit certifications regarding federal lobbying activities as required by Section 1352, Title 31, United States Code and that all such certifications are made a part of any subcontracts entered into as a result of this Contract.

DISCLOSURE OF LOBBYING ACTIVITIES

COMPLETE THIS FORM TO DISCLOSE LOBBYING ACTIVITIES PURSUANT TO 31 U.S.C. 1352

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance | 2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award | 3. Report Type: <input type="checkbox"/> a. initial <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____ |
| 4. Name and Address of Reporting Entity <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known Congressional District, if known | 5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime: Congressional District, if known | |
| 6. Federal Department/Agency: | 7. Federal Program Name/Description: CFDA Number, if applicable _____ | |
| 8. Federal Action Number, if known: | 9. Award Amount, if known: | |
| 10. Name and Address of Lobby Entity (If individual, last name, first name, MI) | 11. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI) | |
| (attach Continuation Sheet(s) if necessary) | | |
| 12. Amount of Payment (check all that apply) \$ _____ <input type="checkbox"/> actual <input type="checkbox"/> planned | 14. Type of Payment (check all that apply) <input type="checkbox"/> a. retainer <input type="checkbox"/> b. one-time fee <input type="checkbox"/> c. commission <input type="checkbox"/> d. contingent fee <input type="checkbox"/> e. deferred <input type="checkbox"/> f. other, specify _____ | |
| 13. Form of Payment (check all that apply): <input type="checkbox"/> a. cash <input type="checkbox"/> b. in-kind; specify: nature _____ Value _____ | | |
| 15. Brief Description of Services Performed or to be performed and Date(s) of Service, including officer(s), employee(s), or member(s) contacted, for Payment Indicated in Item 11: (attach Continuation Sheet(s) if necessary) | | |
| 16. Continuation Sheet(s) attached: Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| 17. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying reliance was placed by the tier above when his transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semiannually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure. | Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____ | |
| Federal Use Only: | Authorized for Local Reproduction Standard Form - LLL | |

Standard Form LLL Rev. 04-28-06

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime federal recipient at the initiation or receipt of covered federal action or a material change to previous filing pursuant to title 31 U.S.C. Section 1352. The filing of a form is required for such payment or agreement to make payment to lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress an officer or employee of Congress or an employee of a Member of Congress in connection with a covered federal action. Attach a continuation sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered federal action for which lobbying activity is or has been secured to influence, the outcome of a covered federal action.
2. Identify the status of the covered federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last, previously submitted report by this reporting entity for this covered federal action.
4. Enter the full name, address, city, state, and zip code of the reporting entity. Include Congressional District if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to: subcontracts, subgrants, and contract awards under grants.
5. If the organization filing the report in Item 4 checks "Subawardee" then enter the full name, address, city, state, and zip code of the prime federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organization level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the federal program name or description for the covered federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans and loan commitments.
8. Enter the most appropriate federal identifying number available for the federal action identification in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract grant. or loan award number, the application/proposal control number assigned by the federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered federal action where there has been an award or loan commitment by the Federal agency, enter the federal amount of the award/loan commitments for the prime entity identified in item 4 or 5.
10. Enter the full name, address, city, state, and zip code of the lobbying entity engaged by the reporting entity identified in Item 4 to influence the covered federal action.
11. Enter the full names of the individual(s) performing services and include full address if different from 10 (a). Enter Last Name, First Name and Middle Initial (MI).
12. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (Item 4) to the lobbying entity (Item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
13. Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
14. Check all boxes that apply. If other, specify nature.
15. Provide a specific and detailed description of the services that the lobbyist has performed or will be expected to perform and the date(s) of any services rendered. Include all preparatory and related activity not just time spent in actual contact with federal officials. Identify the federal officer(s) or employee(s) contacted or the officer(s) employee(s) or Member(s) of Congress that were contacted.
16. Check whether or not a continuation sheet(s) is attached.
17. The certifying official shall sign and date the form, and print his/her name title and telephone number.

Public reporting burden for this collection of information is estimated to average 30-minutes per response, including time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503. SF-LLL-Instructions Rev. 06-04

OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

You may opt out of the payment adjustments for price index fluctuations as specified in "Payment Adjustments for Price Index Fluctuations" of the Standard Specifications. If you elect to opt out of the provisions of this specification, complete this form and submit it with your bid.

Bidder Name: _____

Contract No. 3605; CIP No. 77137

I opt out of the payment adjustments for price index fluctuations.

Date: _____

Signature: _____

Accompanying this proposal is _____
(NOTICE: INSERT THE WORDS "CASH(\$___),"CASHIER'S CHECK," "CERTIFIED CHECK," OR "BIDDERS BOND," AS THE CASE MAY BE)

in amount equal to at least ten percent of the amount of the total bid.

The names of all persons interested in the forgoing Proposal as principals are as follows:

IMPORTANT NOTICE: If the Bidder or other interested person is a corporation, state legal name of corporation and place of incorporation, also names of the president, secretary, treasurer, and executive officer thereof; if a partnership, state name of partnership, also names of all individual partners; if Bidder or other interested person is an individual, state first and last names in full.

Licensed in accordance with an act providing for the registration of Contractors,

License No. _____ Classification(s) _____

(A Copy of the afore-referenced license must be attached hereto.)

ADDENDA: This Proposal is submitted with respect to the changes to the Contract included in addenda number (s) _____

(Fill in addenda numbers if addenda have been received and insert, in this Proposal, any Proposal Pay Items and Bid Price Schedules that were received as part of the addenda)

By my signature on this Proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232, and 10285.1 are true and correct and that the Bidder has complied with the requirements of Sections 4104 of the Subletting and Subcontracting Fair Practices Act and of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5 of Division 4 of Title 2 of the California Code of Regulations). By my signature on this Proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106; and the Equal Employment Opportunity Certification; Iran Contracting Act Certification, and the Debarment Suspension, Ineligibility and Voluntary Exclusion Certification; the Non-lobbying Certification for Federal-Aid Contracts and the Disclosure of Lobbying Activities (Standard Form LLL); the Fair Employment Practice Addendum, the Nondiscrimination Assurances, and the Opt Out of Payment Adjustments for Price Index Fluctuations, if elected, the Electronic Files Usage Acknowledgement form, if elected, Certification Of Bidder's Pre-Fabricated Bridge Manufacturer's Qualifications, and Cleaning and Painting Certification of Bidder or Bidder's Subcontractor are true and correct.

The person or persons executing this Proposal on behalf of a corporation or partnership shall be prepared to demonstrate by resolution, article, or otherwise, that such person is or that such persons are appropriately authorized to act in these regards for such corporation or partnership. Such authority shall be demonstrated to the satisfaction of the County of El Dorado.

If the signature is by an agent other than an officer of a corporation or a member of a partnership, a power of attorney authorizing said act by the agent on behalf of his principal shall be submitted with the bid forms; otherwise, the bid may be disregarded as irregular and unauthorized.

The Bidder's execution on the signature portion of this Proposal shall constitute an endorsement and execution of those affidavits, declarations and certifications which are part of this Proposal.

Executed this _____ day of _____, 20__

at _____ County, State of _____



Name and Title of Bidder _____

Name of Firm _____

INSTRUCTIONS – CONSTRUCTION CONTRACT DBE COMMITMENT

ALL BIDDERS:

PLEASE NOTE: This information may be submitted with your bid. If it is not, and you are the apparent low bidder or the second or third low bidder, it must be submitted and received as specified in the Special Provisions. Failure to submit the required DBE commitment will be grounds for finding the bid non-responsive.

The form requires specific information regarding the construction contract: Local Agency, Location, Project Description, Total Contract Amount, Bid Date, Bidder's Name, and Contract DBE Goal.

The form has a column for the Description of Work, Service, or Materials Supplied (Box 11). The bid item number and description of work, service, or materials supplied to be provided by DBEs must be provided in this section. Prime contractors shall indicate all work to be performed by DBEs including, if the prime is a DBE, work performed by its own forces, if a DBE. The DBE shall provide a certification number to the Contractor and expiration date. Enter the DBE prime's and subcontractors' certification numbers. The form has a column for the DBE Contact Information (who must be certified on the date bids are opened and include the DBE address and phone number).

The form has a line for Total Dollar Amount for ALL Subcontractors (Line 8). Enter the total dollar amount for all subcontracted contractors (both DBE and Non-DBE) on this line. Do not include the prime contractor information in this count. The Form has a line for Total Number of ALL Subcontractors (Line 9). Enter the total number of all subcontracted contractors (both DBE and Non-DBE). Do not include the prime contractor information in this count.

IMPORTANT: Identify **all** DBE firms participating in the project regardless of tier. Names of the First-Tier DBE Subcontractors and their respective item(s) of work listed should be consistent, where applicable, with the names and items of work in the " Subcontractor List" submitted with your bid.

There is a column for the DBE participation dollar amount (Box 14). Enter the Total Claimed DBE Participation dollars and percentage amount of items of work submitted with your bid pursuant to the Special Provisions. (If 100% of item is not to be performed or furnished by the DBE, describe exact portion of item to be performed or furnished by the DBE.) See Section 2-1.12B to determine how to count the participation of DBE firms.

Exhibit 15-G must be signed and dated by the person bidding. Also list a phone number in the space provided and print the name of the person to contact.

Local agencies should complete the Local Agency Contract Award, Federal-aid Project Number, Federal Share, Contract Award Date fields and verify that all information is complete and accurate before signing and filing.

**EXHIBIT 15-H DBE INFORMATION —GOOD FAITH EFFORTS
DBE INFORMATION - GOOD FAITH EFFORTS**

Federal-aid Project No. BRLO 5925(103) Bid Opening Date March 28, 2019

The County of El Dorado established a Disadvantaged Business Enterprise (DBE) goal of **13%** for this project. The information provided herein shows that a good faith effort was made.

Lowest, second lowest and third lowest bidders shall submit the following information to document adequate good faith efforts. Bidders should submit the following information even if the "Local Agency Bidder DBE Commitment" form indicates that the bidder has met the DBE goal. This will protect the bidder's eligibility for award of the contract if the administering agency determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

Submittal of only the "15-G – Construction Contract DBE Commitment" form may not provide sufficient documentation to demonstrate that adequate good faith efforts were made.

The following items are listed in the Section 2-1.12B(3):

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

| Publications | Dates of Advertisement |
|--------------|------------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

| Names of DBEs Solicited | Date of Initial Solicitation | Follow Up Methods and Dates |
|-------------------------|------------------------------|-----------------------------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

C. The items of work which the bidder made available to DBE firms including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation was made available to DBE firms.

| Items of Work | Bidder Normally Performs Item (Y/N) | Breakdown of Items | Amount (\$) | Percentage Of Contract |
|---------------|-------------------------------------|--------------------|-------------|------------------------|
| | | | | |
| | | | | |
| | | | | |

D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, the firms selected for that work (please attach copies of quotes from the firms involved), and the price difference for each DBE if the selected firm is not a DBE:

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

Names, addresses and phone numbers of firms selected for the work above:

E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs:

F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate:

G. The names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (please attach copies of requests to agencies and any responses received, i.e., lists, Internet page download, etc.):

| Name of Agency/Organization | Method/Date of Contact | Results |
|-----------------------------|------------------------|---------|
| | | |
| | | |

H. Any additional data to support a demonstration of good faith efforts (use additional sheets if necessary):

NOTE: USE ADDITIONAL SHEETS OF PAPER IF NECESSARY.

END OF PROPOSAL

YEAR

20 **Withholding Exemption Certificate**

CALIFORNIA FORM

590

(This form can only be used to certify exemption from nonresident withholding under California R&TC Section 18662. This form cannot be used for exemption from wage withholding.)

| | | | |
|-----------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| File this form with your withholding agent. (Please type or print) | | Withholding agent's name | |
| Vendor/Payee's name | | Vendor/Payee's <input type="checkbox"/> Social security number <input type="checkbox"/> SOS no. <input type="checkbox"/> California corp. no. <input type="checkbox"/> FEIN | |
| Vendor/Payee's address (number and street) | | APT no. | Private Mailbox no. |
| City | | Vendor/Payee's daytime telephone no. () | |
| State | | ZIP Code | |

I certify that for the reasons checked below, the entity or individual named on this form is exempt from the California income tax withholding requirement on payment(s) made to the entity or individual. Read the following carefully and check the box that applies to the vendor/payee:

Individuals — Certification of Residency:

I am a resident of California and I reside at the address shown above. If I become a nonresident at any time, I will promptly inform the withholding agent. See instructions for Form 590, General Information D, for the definition of a resident.

Corporations:

The above-named corporation has a permanent place of business in California at the address shown above or is qualified through the California Secretary of State to do business in California. The corporation will withhold on payments of California source income to nonresidents when required. If this corporation ceases to have a permanent place of business in California or ceases to be qualified to do business in California, I will promptly inform the withholding agent. See instructions for Form 590, General Information E, for the definition of permanent place of business.

Partnerships:

The above-named partnership has a permanent place of business in California at the address shown above or is registered with the California Secretary of State, and is subject to the laws of California. The partnership will file a California tax return and will withhold on foreign and domestic nonresident partners when required. If the partnership ceases to do any of the above, I will promptly inform the withholding agent. **Note:** For withholding purposes, a Limited Liability Partnership is treated like any other partnership.

Limited Liability Companies (LLC):

The above-named LLC has a permanent place of business in California at the address shown above or is registered with the California Secretary of State, and is subject to the laws of California. The LLC will file a California tax return and will withhold on foreign and domestic nonresident members when required. If the LLC ceases to do any of the above, I will promptly inform the withholding agent.

Tax-Exempt Entities:

The above-named entity is exempt from tax under California R&TC Section 23701 _____ (insert letter) or Internal Revenue Code Section 501(c) _____ (insert number). The tax-exempt entity will withhold on payments of California source income to nonresidents when required. If this entity ceases to be exempt from tax, I will promptly inform the withholding agent.

Note: Individuals cannot be tax-exempt entities.

Insurance Companies, IRAs, or Qualified Pension/Profit Sharing Plans:

The above-named entity is an insurance company, IRA, or a federally qualified pension or profit-sharing plan.

California Irrevocable Trusts:

At least one trustee of the above-named irrevocable trust is a California resident. The trust will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required. If the trustee becomes a nonresident at any time, I will promptly inform the withholding agent.

Estates — Certification of Residency of Deceased Person:

I am the executor of the above-named person's estate. The decedent was a California resident at the time of death. The estate will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required.

CERTIFICATE: Please complete and sign below.

Under penalties of perjury, I hereby certify that the information provided herein is, to the best of my knowledge, true and correct. If conditions change, I will promptly inform the withholding agent.

Vendor/Payee's name and title (type or print) _____

Vendor/Payee's signature ► _____ Date _____

Instructions for Form 590

Withholding Exemption Certificate

References in these instructions are to the California Revenue and Taxation Code (R&TC).

General Information

A Purpose

Use Form 590 to certify an exemption from nonresident withholding. Complete and present Form 590 to the withholding agent. The withholding agent will then be relieved of the withholding requirements if the agent relies in good faith on a completed and signed Form 590 unless told by the Franchise Tax Board (FTB) that the form should not be relied upon.

Important – This form cannot be used for exemption from wage withholding. Any questions regarding wage withholding should be directed to the California Employment Development Department.

Do not use Form 590 if you are a seller of California real estate. Sellers of California real estate should use Form 593-C, Real Estate Withholding Certificate.

B Law

R&TC Section 18662 requires withholding of income or franchise tax on payments of California source income made to nonresidents of California.

Withholding is required on:

- Payments to nonresidents for services rendered in California;
- Distributions of California source income made to domestic nonresident partners and members and allocations of California source income made to foreign partners and members;
- Payments to nonresidents for rents if the payments are made in the course of the withholding agent's business;
- Payments to nonresidents for royalties for the right to use natural resources located in California;
- Distributions of California source income to nonresident beneficiaries from an estate or trust; and
- Prizes and winnings received by nonresidents for contests in California.

For more information on withholding and waiver requests, get FTB Pub. 1017, Nonresident Withholding Partnership Guidelines, and FTB Pub. 1023, Nonresident Withholding Independent Contractor, Rent and Royalty Guidelines. To get a withholding publication see General Information G.

C Who can Execute this Form

Form 590 can be executed by the entities listed on this form.

Note: In a situation where payment is being made for the services of a performing entity, this form can only be completed by the performing entity or the performing entity's partnership or corporation. It **cannot** be completed by the performing entity's agent or other third party.

Note: The grantor of a revocable/grantor trust shall be treated as the vendor/payee for withholding purposes. Therefore, if the vendor/payee is a revocable/grantor trust and one or more of the grantors is a nonresident, withhold-

ing is required. If all of the grantors of a revocable/grantor trust are residents, no withholding is required. Resident grantors can check the box on Form 590 labeled "Individuals — Certification of Residency."

D Who is a Resident

A California resident is any individual who is in California for other than a temporary or transitory purpose or any individual domiciled in California who is absent for a temporary or transitory purpose.

An individual domiciled in California who is absent from California for an uninterrupted period of at least 546 consecutive days under an employment-related contract is considered outside California for other than a temporary or transitory purpose.

Note: Return visits to California that do not total more than 45 days during any taxable year covered by the employment contract are considered temporary.

This provision does not apply if an individual has income from stocks, bonds, notes, or other intangible personal property in excess of \$200,000 in any taxable year in which the employment-related contract is in effect.

A spouse who is absent from California for an uninterrupted period of at least 546 days to accompany a spouse who is under an employment-related contract is considered outside of California for other than a temporary or transitory purpose.

Generally, an individual who comes to California for a purpose which will extend over a long or indefinite period will be considered a resident. However, an individual who comes to perform a particular contract of short duration will be considered a nonresident. For assistance in determining resident status, get FTB Pub. 1031, Guidelines for Determining Resident Status, or call the Franchise Tax Board at (800) 852-5711 or (916) 845-6500 (not toll-free).

E What is a Permanent Place of Business

A corporation has a permanent place of business in California if it is organized and existing under the laws of California or if it is a foreign corporation qualified to transact intrastate business by the California Secretary of State. A corporation that has not qualified to transact intrastate business (e.g., a corporation engaged exclusively in interstate commerce) will be considered as having a permanent place of business in California only if it maintains a permanent office in California that is permanently staffed by its employees.

F Withholding Agent

Keep Form 590 for your records. Do not send this form to the FTB unless it has been specifically requested.

Note: If the withholding agent has received Form 594, Notice to Withhold Tax at Source, only the performing entity can complete and

sign Form 590 as the vendor/payee. If the performing entity completes and signs Form 590 indicating no withholding requirement, you must send a copy of Form 590 with Form 594 to the FTB.

For more information, contact the Withholding Services and Compliance Section. See General Information G.

The vendor/payee must notify the withholding agent if:

- The individual vendor/payee becomes a nonresident;
- The corporation ceases to have a permanent place of business in California or ceases to be qualified to do business in California;
- The partnership ceases to have a permanent place of business in California;
- The LLC ceases to have a permanent place of business in California; or
- The tax-exempt entity loses its tax-exempt status.

The withholding agent must then withhold. Remit the withholding using Form 592-A, Nonresident Withholding Remittance Statement, and complete Form 592, Nonresident Withholding Annual Return, and Form 592-B, Nonresident Withholding Tax Statement.

G Where to get Publications, Forms, and Additional Information

You can download, view, and print FTB Publications 1017, 1023, 1024, and nonresident withholding forms, as well as other California tax forms and publications not related to nonresident withholding from our Website at: www.ftb.ca.gov

To have publications or forms mailed to you or to get additional nonresident withholding information, please contact the Withholding Services and Compliance Section.

WITHHOLDING SERVICES AND
COMPLIANCE SECTION
FRANCHISE TAX BOARD
PO BOX 942867
SACRAMENTO CA 94267-0651

Telephone: (888) 792-4900
(916) 845-4900 (not toll-free)
FAX: (916) 845-9512

Assistance for persons with disabilities:
We comply with the Americans with Disabilities Act. Persons with hearing or speech impairments please call TTY/TDD (800) 822-6268.

Asistencia bilingüe en español
Para obtener servicios en español y asistencia para completar su declaración de impuestos/formularios, llame al número de teléfono (anotado arriba) que le corresponde.



County of El Dorado

OFFICE OF AUDITOR-CONTROLLER

JOE HARN, CPA
Auditor-Controller

BOB TOSCANO
Assistant Auditor-Controller

360 FAIR LANE
PLACERVILLE, CALIFORNIA 95667
Phone: (530) 621-5487 FAX: (530) 295-2535

PAYEE DATA RECORD

(Required in lieu of IRS W-9 when receiving payment from the County of El Dorado) Version: April 2014

| | | | | | | | | | | | |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------|-----------------------|---------------|------------------------|-------------------------------------------------|------------------|--|--|--|
| PAYEE DATA RECORD | INSTRUCTIONS: Complete all information on this form. Sign, date, and return to the address shown at the bottom of this page. Prompt return of the fully completed form will prevent delays in processing payments. Information provided in this form will be used by the County of El Dorado to prepare Information Returns (Forms 1099), for withholding on payments to nonresident payees, and for reporting to the Employment Development Department (EDD). | | | | | | | | | | |
| NAME AND ADDRESS | Name (as shown on your income tax return) | | | | | | | | | | |
| | Business name/Doing business as/Disregarded entity name, if different from above | | | | | | | | | | |
| | Physical address (number, street, and apt. or suite) | | | | | | Remittance address (if different than physical) | | | | |
| | City, state, zip code | | | | | | City, state, zip code | | | | |
| | Phone number | | | Fax number (optional) | | | | Email (optional) | | | |
| FEDERAL TAX CLASSIFICATION & EXEMPTIONS | Check appropriate federal tax classification <input type="radio"/> Individual / sole proprietor <input type="radio"/> Partnership <input type="radio"/> Trust / estate <input type="radio"/> Other (see instructions) ▶ _____ <input type="radio"/> C Corporation <input type="radio"/> S Corporation If you are a corporation, do you provide legal or medical services? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Limited liability company. Enter the tax classification (C=C Corporation, S=S Corporation, P=Partnership) _____ | | | | | | | | | | |
| | NOTE: IF YOU ARE A SINGLE MEMBER LLC (DISREGARDED ENTITY), ENTER THE TAX CLASSIFICATION OF THE OWNER IDENTIFIED ON THE NAME LINE. | | | | | | | | | | |
| | Exempt payee code (if any) – see instructions _____ Exemption from FATCA reporting code (if any) – see instructions _____ | | | | | | | | | | |
| TAX IDENTIFICATION NUMBER | Tax identification number (TIN) | | | | | | | | | | |
| | Enter your TIN in the appropriate box. If you are an individual or sole proprietor, you must enter your SSN. You may choose to provide your EIN in addition to, but not instead of, the SSN. Single member LLCs (disregarded entities) must enter the TIN of the owner identified on the Name line. | | | | | | Social Security Number - | | | | |
| RESIDENCY STATUS | Check appropriate box for residency status <input type="radio"/> California resident / exempt from nonresident withholding – qualified to do business in California or maintains a permanent place of business in California (attach CA Form 590) <input type="radio"/> California nonresident (see instructions) | | | | | | | | | | |
| | NOTE: Payments to California nonresidents for services performed in California and for certain rents derived from properties located in California that exceed \$1,500 in a calendar year will be subject to 7% nonresident withholding unless you have obtained a waiver or have been approved for reduced withholding by the Franchise Tax Board. There is no withholding on payments for product and for services performed outside of California. | | | | | | | | | | |
| | <input type="checkbox"/> Obtained Franchise Tax Board waiver of State withholding (attach a copy if applicable) <input type="checkbox"/> Obtained Franchise Tax Board approval for reduced withholding (attach a copy if applicable) | | | | | | | | | | |
| | California sales tax permit number (required only for California nonresident vendors that charge California sales tax) | | | | | | | | | | |
| CERTIFICATION | Under penalties of perjury, I certify that: 1) the TIN shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me) and 2) I am not subject to backup withholding and 3) I am a U.S. citizen or other U.S. person and 4) the FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct. | | | | | | | | | | |
| | Authorized Payee Representative's Name (Type or Print) | | | | | | Title | | | | |
| | Signature | | | Date | | | Telephone | | | | |
| | Should my residency status or any other information provided above change, I will promptly notify County of El Dorado at the address listed above. | | | | | | | | | | |
| RETURN FORM TO | Please return completed form to: | | | | | | | | | | |
| | Department/office: | | Community Development Agency | | | | | | | | |
| | Mailing address: | | 2850 Fairlane Court, Placerville, California 95667 | | | | | | | | |
| | Phone: | 530.621.5150 | Fax: | 530.626.0387 | Email: | kady.leitner@edcgov.us | | | | | |

COUNTY OF EL DORADO, PAYEE DATA RECORD (REVERSE)

| | |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>PAYEE DATA RECORD</p> | <p>A completed Payee Data Record is required for payments to all entities and will be kept on file at the County of El Dorado Auditor-Controller's Office. Payees who do not wish to complete the Payee Data Record may elect to not do business with the County of El Dorado. If the payee does not complete the form and the required payee data is not otherwise provided, payment may be reduced for federal backup withholding, California backup withholding and California nonresident withholding.</p> |
| <p>FEDERAL TAX CLASSIFICATION</p> | <p>Check the applicable federal tax classification. Note that if an LLC is disregarded as an entity separate from its owner, enter the appropriate tax classification of the owner identified on the "Name" line.</p> <p>Individual: Enter the name shown on your income tax return. If the account is in joint names, list first, and then circle, the name of the person or entity whose SSN you entered on the form.</p> <p>Sole proprietor: Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as" name on the "Business name/Doing business as/Disregarded entity name" line.</p> <p>Partnership, C Corporation, or S Corporation: Enter the entity's name on the "Name" line and any business, trade, or "doing business as" name on the "Business name/Doing business as/Disregarded entity name" line.</p> <p>Disregarded entity: Enter the owner's name on the "Name" line. The name of the entity entered on the "Name" line should never be a disregarded entity. The name on the "Name" line must be the name shown on the income tax return on which the income should be reported. Check the appropriate box for the U.S. federal tax classification of the person whose name is entered on the "Name" line (individual/sole proprietor, partnership, C corporation, S corporation, trust/estate).</p> <p>Limited liability company (LLC): If the person identified on the "Name" line is an LLC, check the "Limited Liability Company" box only and enter the appropriate code for the U.S. federal tax classification.</p> <p>Other entities: Enter your business name as shown on required U.S. federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade or DBA name on the "Business name/Doing business as/Disregarded entity name" line.</p> |
| <p>EXEMPTIONS</p> | <p>Exemptions: If you are exempt from backup withholding and/or FATCA reporting, enter in the exemptions box any code(s) that may apply to you. Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends. Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions. The following codes identify payees that are exempt from backup withholding: 1 – an organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2); 2 – The United States or any of its agencies or instrumentalities; 3 – A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities; 4 – A foreign government or any of its political subdivisions, agencies, or instrumentalities; 5 – A corporation; 6 – A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States; 7 – A futures commission merchant registered with the Commodity Futures Trading Commission; 8 – A real estate investment fund; 9 – An entity registered at all times during the tax year under the Investment Company Act of 1940; 10 – A common trust fund operated by a bank under section 584(a); 11 – A financial institution; 12 – A middleman known in the investment community as a nominee or custodian; 13 – A trust exempt from tax under section 664 or described in section 4947.</p> <p>Exemption from FATCA reporting. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37); B—The United States or any of its agencies or instrumentalities; C—A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities; D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Reg. section 1.1472-1(c)(1)(i); E—A corporation that is a member of the same expanded affiliated group as a corporation described in Reg. section 1.1472-1(c)(1)(i); F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state.</p> |
| <p>TAX IDENTIFICATION NUMBER</p> | <p>Enter your tax identification number (TIN) in the appropriate box. If you are a single member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN. The TIN for individuals and sole proprietors is the Social Security Number (SSN). Sole proprietors may provide their EIN in addition to but not instead of a SSN.</p> <p>The County of El Dorado requires that all parties entering into business transactions that may lead to payment(s) from the County provide their Taxpayer Identification Number (TIN). The TIN is also required by the California Revenue and Taxation Code Section 18646 to facilitate tax compliance enforcement activities and the preparation of Form 1099 and other information returns as required by the Internal Revenue Code Section 6109(a).</p> |
| <p>RESIDENCY STATUS</p> | <p>Are you a California resident or nonresident?</p> <p>A corporation will be defined as a "resident" if it has a permanent place of business in California or is qualified through the Secretary of State to do business in California. A partnership is considered a resident partnership if it has a permanent place of business in California. An estate is a resident if the decedent was a California resident at time of death. A trust is a resident if at least one trustee is a California resident. For individuals and sole proprietors, the term "resident" includes every individual who is in California for other than a temporary or transitory purpose and any individual domiciled in California who is absent for a temporary or transitory purpose. Generally, an individual who comes to California for a purpose that will extend over a long or indefinite period will be considered a resident. However, an individual who comes to perform a particular contract of short duration will be considered a nonresident.</p> <p>Payments to all nonresidents may be subject to withholding. Nonresident payees performing services in California or receiving certain rent, lease, or royalty payments from property (real or personal) located in California will have 7% of their total payments withheld for State income taxes. However, no withholding is required if total payments to the payee are \$1,500 or less for the calendar year or if payment is for product. Nonresidents who have been granted a waiver on payments of California source income from the California Franchise Tax Board must submit a copy of the waiver. For information on Nonresident Withholding, contact the Franchise Tax Board at the numbers listed below:</p> <p style="text-align: center;">Withholding Services and Compliance Section: 1-888-792-4900 E-mail address: wscs.gen@ftb.ca.gov</p> <p style="text-align: center;">For hearing impaired with TDD, call: 1-800-822-6268 Website: www.ftb.ca.gov</p> <p>California nonresidents charging California sales tax are required to provide their California sales tax number.</p> |
| <p>CERTIFICATION</p> | <p>Provide the name, title, signature, and telephone number of the authorized individual completing this form. Provide the date the form was completed. NOTE: You must cross out item 2 in the certification block if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return.</p> |

COUNTY OF EL DORADO

BIDDER'S BOND

this form MUST be used

KNOW ALL PEOPLE BY THESE PRESENTS, THAT WE _____
_____ as **PRINCIPAL**, and

as Surety are held and firmly bound unto the County of El Dorado, a political subdivision of the State of California (hereinafter referred to as "Obligee"), in the penal sum of **TEN (10) PERCENT OF THE AMOUNT OF THE TOTAL BID PRICE** of the Principal above named, submitted by said Principal to the Obligee for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made to the Obligee, we the Principal and Surety bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. In no case shall the liability of the Surety hereunder exceed the sum of

TEN PERCENT (10%) OF THE AMOUNT OF THE TOTAL BID PRICE

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal has submitted the above-mentioned Bid to the Obligee, as aforesaid, for certain construction specifically described as follows, for which bids are to be opened at Placerville, El Dorado County, California, for the construction of the

**GREENSTONE RD AT SLATE CREEK BRIDGE REPLACEMENT
CIP No. 77137 / CONTRACT No. 3605**

NOW, THEREFORE, if the aforesaid Principal is awarded the Contract and, within the time and manner required under the Contract Documents, after the prescribed forms are presented to it for signature, enters into a written contract, in the prescribed form, in accordance with the Bid, and files two bonds with the Obligee, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise, it shall remain in full force and virtue.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the Court.

IN WITNESS WHEREOF, we have set our hands and seals on this _____ day of _____ 20__

Bond No. _____

(seal) _____
Principal

(seal) _____
Surety

Address: _____

(NOTE: Signature of those executing for the Surety shall be properly acknowledged, and accompanied by a Certificate of Acknowledgment.)

SURETY

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____,
(here insert name and title of the officer)

personally appeared _____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)