

FORM APPROVED COUNTY COUNSEL
 BY: GREGORY P. PRIAMOS
 DATE: 10/3/14

Departmental Concurrence

FORM APPROVED COUNTY COUNSEL
 BY: MARSHA L. VICTOR
 DATE: 10/2/14

**SUBMITTAL TO THE BOARD OF SUPERVISORS
 COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

817A



FROM: TLMA - Transportation Department

SUBMITTAL DATE:
 September 24, 2014

SUBJECT: Approval of the Plans and Specifications for the Interstate 215 at Newport Road Interchange Project, City of Menifee. 3rd/5th District (Clerk to Advertise); [\$25,425,475]; Federal Funds 51.3%, Local Funds 48.7%

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the plans and specifications for the construction of Interstate 215 at Newport Road Interchange Project, City of Menifee; and
2. Authorize the Clerk of the Board to advertise for bids to be received in the office of the Director of Transportation and Land Management up to the hour of 2:00 p.m., Wednesday, December 3, 2014, at which time, bids will be opened.

JCP:jjr:sb

Patricia Romo

Patricia Romo
 Assistant Director of Transportation
 for Juan C. Perez
 Director of Transportation and Land Management

FINANCIAL DATA	Current Fiscal Year:	Next Fiscal Year:	Total Cost:	Ongoing Cost:	POLICY/CONSENT (Per Exec. Office)
COST	\$ 5,000,000	\$ 20,425,475	\$ 25,425,475	\$ 0	Consent <input type="checkbox"/> Policy <input checked="" type="checkbox"/>
NET COUNTY COST	\$ 0	\$ 0	\$ 0	\$ 0	

SOURCE OF FUNDS: STP Discretionary (51.3%), Menifee RBBD (3.5%), City of Menifee (45.2%). There are no General Funds used in this project.

Budget Adjustment: No
 For Fiscal Year: 2014/2015

C.E.O. RECOMMENDATION:

APPROVE
Tina Grande
 BY: Tina Grande

County Executive Office Signature

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Benoit, seconded by Supervisor Stone and duly carried, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Jeffries, Stone and Benoit
 Nays: None
 Absent: Tavaglione and Ashley
 Date: October 21, 2014
 xc: Transp., COB

Kecia Harper-Ihem
 Clerk of the Board
 By: *Kecia Harper-Ihem*
 Deputy

- A-30
- Positions Added
- 4/5 Vote
- Change Order

Prev. Agn. Ref.: 9/11/12, Item 3-44, 7/1/14, Item 3-53

District: 3/5

Agenda Number:

3-33

SUBMITTAL TO THE BOARD OF SUPERVISORS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
FORM 11: Approval of the Plans and Specifications for the Interstate 215 at Newport Road Interchange Project, City of Menifee. 3rd/5th District (Clerk to Advertise); [\$25,425,475]; Federal Funds 51.3%, Local Funds 48.7%

DATE: September 24, 2014

PAGE: 2 of 2

BACKGROUND:

Summary

Newport Road is one of the key east-west corridors in southwestern Riverside County. The Newport Road interchange at Interstate 215 (I-215), within the City of Menifee (City), serves developing communities in the City and unincorporated County of Riverside (County).

Since the County has extensive experience in administering construction contracts for interchange projects involving federal and state agencies, the County and the City have mutually agreed to designate the County as the lead agency for this interchange project. A cooperative agreement between the County and City for the construction of the Newport Road interchange at I-215 was approved by the Board of Supervisors (Board) on September 11, 2012 (Agenda Item 3-44). This cooperative agreement designated the County as the lead agency for the construction of the interchange project. The County proposes to construct improvements to the Newport Road interchange at I-215. The existing ramps will be reconstructed, new loop on-ramps will be constructed, and Newport Road will be widened to six through lanes between Haun and Antelope roads. This interchange will increase capacity and improve traffic operations for current and future traffic volume.

A construction cooperative agreement between the California Department of Transportation (Caltrans) and the County for the construction of the improvements at the I-215/Newport Road Interchange Project was approved by the Board on July 1, 2014 (Agenda Item 3-53). This agreement authorizes the County to administer the construction contract. The costs of project oversight and quality assurance will be borne by the State.

The plans and specifications have been approved as to form by County Counsel, and environmental clearance is complete.

Project Number: B5-0682

Federal Aid No.: STPLN-5956(234)

Impact on Residents and Businesses

The proposed improvements will benefit the residents and businesses by expanding the capacity of the interchange and widening Newport Road across I-215; upgrades will enhance traffic flow and safety and reduce traffic congestion at the interchange.

The work is scheduled to begin in early 2015. The work will be phased to keep the interchange open during construction and will take approximately 1.5 years to complete.

SUPPLEMENTAL:

Additional Fiscal Information

The construction contract is estimated to cost approximately \$25,425,475, and construction is expected to finish in FY 2016/2017. The project is funded with STP Discretionary-Federal Funds, Menifee Road and Bridge Benefit District, and City funds.

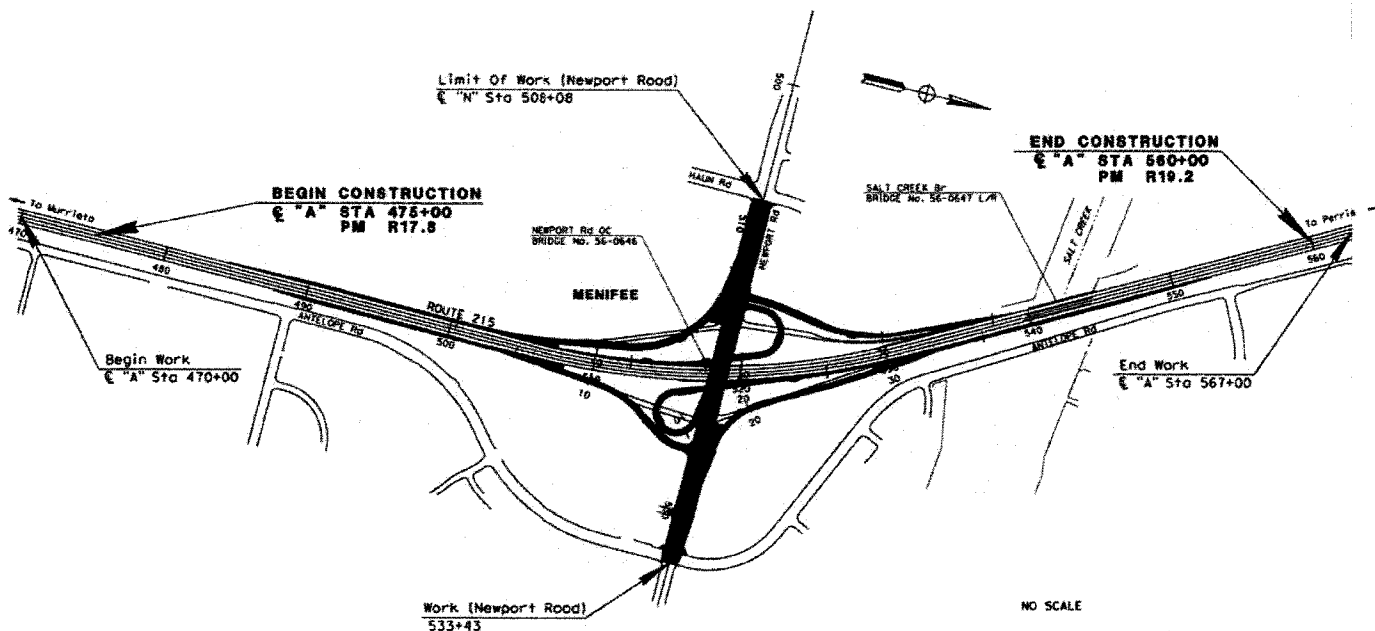
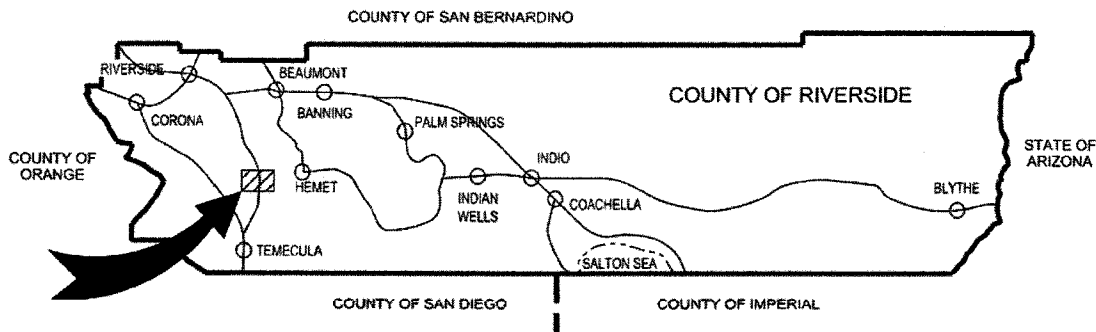
There are no General Funds used in this project.

Contract History and Price Reasonableness

N/A

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)



VICINITY MAP

TOWNSHIP 5S RANGE 3W SECTION 34, 35
and
TOWNSHIP 6S RANGE 3W SECTION 2, 3
COUNTY ROAD BOOK PAGE No. 69, 71, 113, 117



OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

October 24, 2014

THE PRESS ENTERPRISE
ATTN: LEGALS
PO BOX 792
RIVERSIDE, CA 92501

FAX (951) 368-9018
E-MAIL: legals@pe.com

RE: NOTICE INVITING BIDS: INTERSTATE 215 AT NEWPORT ROAD B5-0682

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TEN (10) TIMES:**

Wednesday	- October 29, 2014	Monday	- November 3, 2014
Thursday	- October 30, 2014	Tuesday	- November 4, 2014
Friday	- October 31, 2014	Wednesday	- November 5, 2014
Saturday	- November 1, 2014	Thursday	- November 6, 2014
Sunday	- November 2, 2014	Friday	- November 7, 2014

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Cecilia Gil

Board Assistant to:
KECIA HARPER-IHEM, CLERK OF THE BOARD

Gil, Cecilia

From: PEC Legals Master <legalsmaster@pe.com>
Sent: Friday, October 24, 2014 8:36 AM
To: Gil, Cecilia
Subject: Re: FOR PUBLICATION: Bids for Interstate 215 @ Newport Road B5-0682

Received for publication on October 29. Proof with cost to follow.

Thank You!
Legal Advertising



Phone: 1-800-880-0345 / Fax: 951-368-9018 / E-mail: legals@pe.com

Please Note NEW Deadlines (effective 06/14): Deadline is 10:30 AM, three (3) business days prior to the date you would like to publish.

****Additional days required for larger ad sizes****

From: Gil, Cecilia <CCGIL@rcbos.org>
Sent: Friday, October 24, 2014 8:26 AM
To: PEC Legals Master
Subject: FOR PUBLICATION: Bids for Interstate 215 @ Newport Road B5-0682

Good morning!

Attached is a Notice Inviting Bids, for publication from Oct. 29 to November 7, 2014. Please confirm. THANK you!

Cecilia Gil
Board Assistant
Clerk of the Board
951-955-8464
MS# 1010

County of Riverside

Notice to Bidders

Sealed Bids will be received at the Riverside County Transportation Department, 14th Street Transportation Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 until 2:00 pm on **Wednesday, December 3, 2014** at which time they will be publicly opened at said address, for construction in accordance with the specifications therefore, to which special reference is made, as follows: County of Riverside,

**Interstate 215 at Newport Road
Interchange Improvements
In the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN – 5956 (234)**

The DBE Contract goal is **3.0** percent.

A pre-bid meeting is scheduled for 2:15 pm on **Wednesday, November 19, 2014**, at the County of Riverside Transportation Department, 3525 14th Street, Riverside, California 92501. This meeting is to inform bidders of project requirements and subcontractors of subcontracting and material supply opportunities. Bidder's attendance at this meeting will be mandatory.

This project is subject to the "Buy America" provisions of the Surface Transportation Assistance Act of 1982 as amended by the Intermodal Surface Transportation Assistance Efficiency Act of 1991.

Bids are required for the entire work described herein. The Contractor shall possess a current and active State of California Class "A" Contractor's license at the time this contract is awarded. The successful bidder shall furnish a payment bond and a performance bond.

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

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry, in writing, prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest. Technical questions should be directed to the office of the County of Riverside Transportation Department, 3525 14th Street, Riverside, CA 92501, telephone (951) 955-6780, electronic mail: jrjimenez@rctlma.org.

Plans and specifications may be obtained for a Nonrefundable Fee of **\$110.00** per set with 11" x 17" plans and CD with PDF copy of plans, plus mailing costs, and are available at 3525 14th Street, Riverside, CA 92501.

Engineering Estimate	\$25,000,000 - \$29,000,000 (Base Bid)
Bid Bond	10%
Performance Bond	100%
Payment Bond	100%
Working Days	360

Website: <http://rctlma.org/trans/Contractors-Corner/Notices-Inviting-Bids>

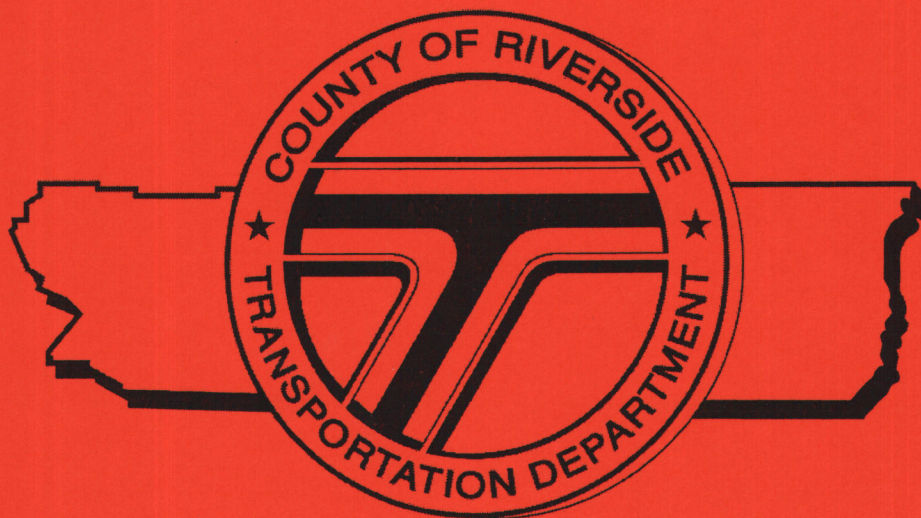
Dated: Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

817A

SPECIFICATIONS and CONTRACT DOCUMENTS
for the
CONSTRUCTION
of

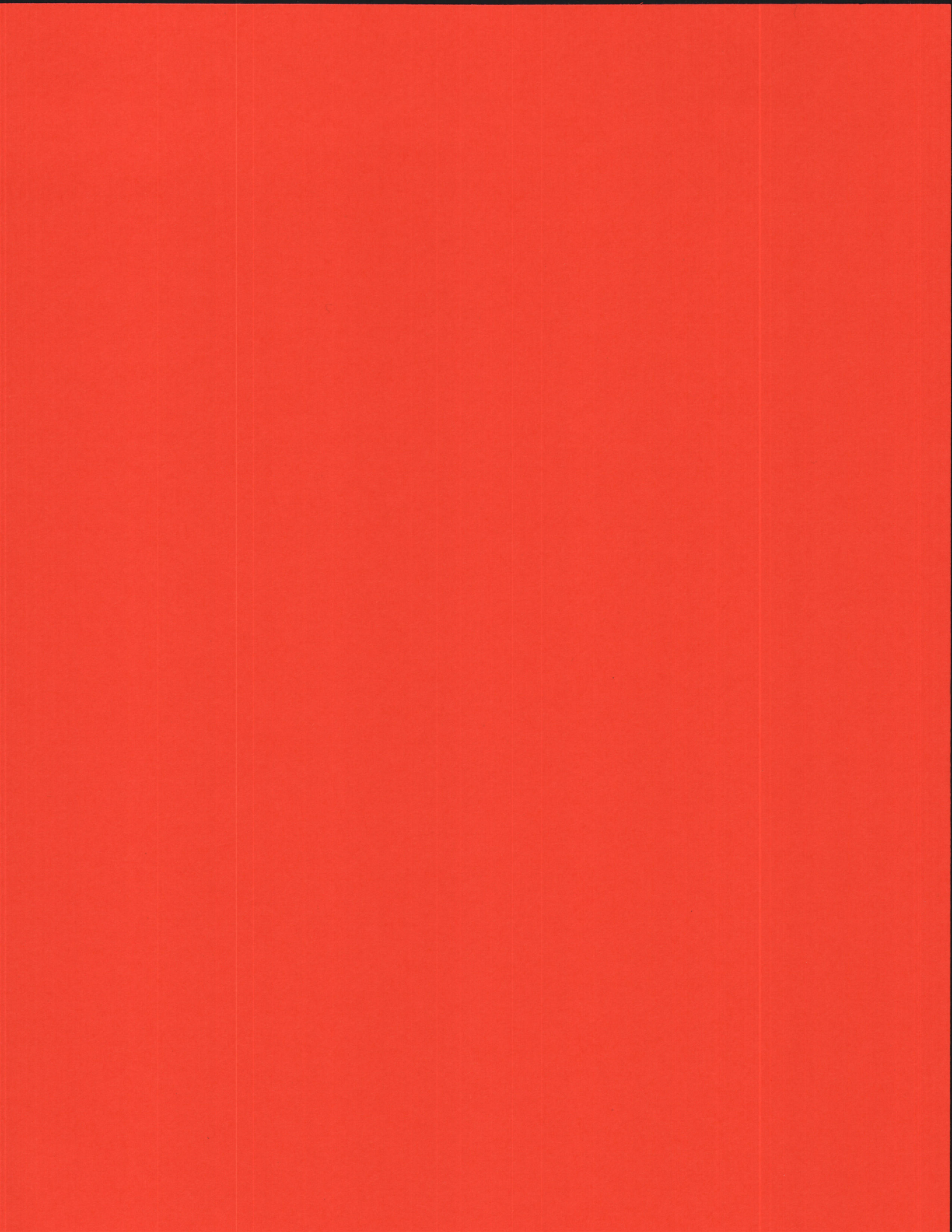
Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)

Book 1 of 2



TRANSPORTATION DEPARTMENT

FORM APPROVED COUNTY COUNSEL
BY: MAARSHAL L. VICTOR
DATE: 10/2/14



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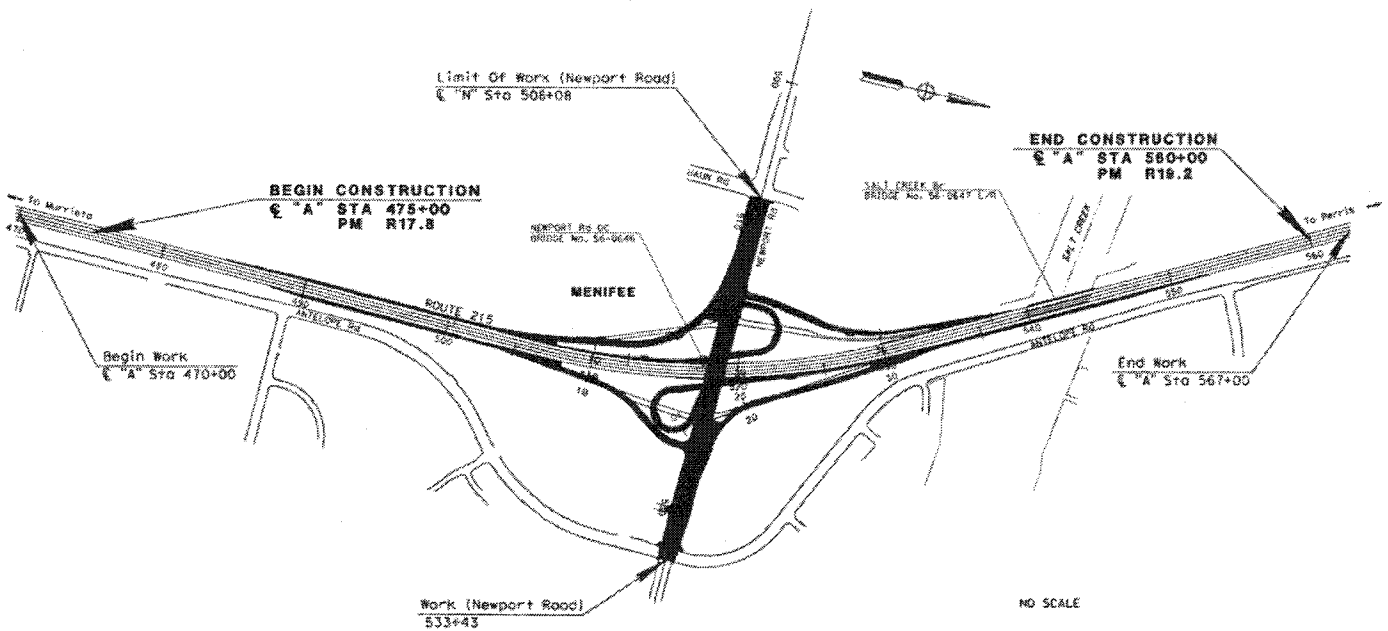
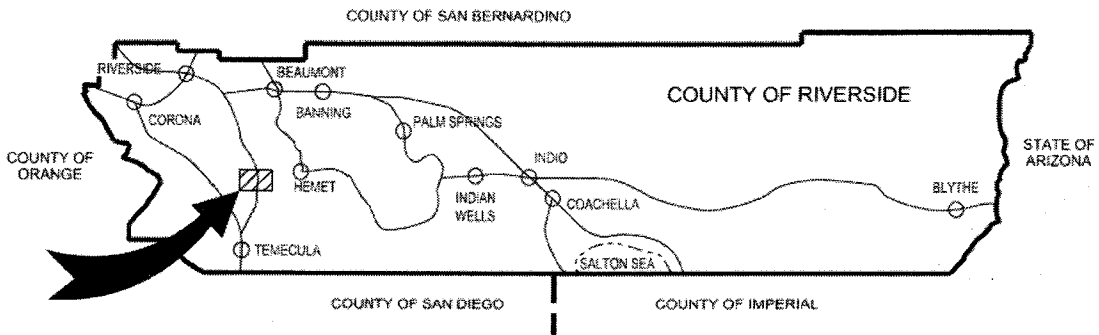
* Note: See the first page of this document description for a detailed Table of Contents.

Book 2 of 2:

- Eastern Municipal Water District (EMWD) Specifications
- Caltrans Revised Standard Specifications Dated 03-21-14

COUNTY OF RIVERSIDE
TRANSPORTATION DEPARTMENT

Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
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VICINITY MAP

TOWNSHIP 5S RANGE 3W SECTION 34 35
and
TOWNSHIP 6S RANGE 3W SECTION 2 3
COUNTY ROAD BOOK PAGE No. 69, 71, 113, 117

Specification and Contract Documents

for the construction of

Interstate 215 at Newport Road

Interchange Project

in the City of Menifee

Project No. B5-0682

Federal Aid No. STPLN- 5956(234)

Contract Approval(s):

Recommended by:



Cindi A. Wachi
County Project Manager

6/18/14

Date

Approval:



Khalid Nasim, PE
Engineering Division Manager

6/18/14

Date

Specification and Contract Documents

for the construction of
Interstate 215 at Newport Road
Interchange Project
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)

Engineering Certification(s) (continued)

The explicit specifications, special provisions, and estimates have been prepared by or under the direction of the following Registered Civil Engineer(s):

Roadway

Stephanie Hillebrand

Stephanie Hillebrand, P.E.

6/11/2014

Date



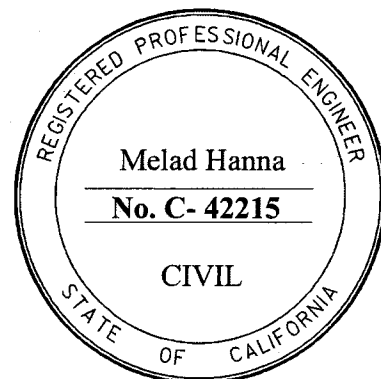
Structures

Melad Hanna

Melad Hanna, P.E.

6/11/2014

Date

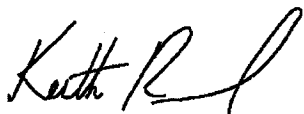


Specification and Contract Documents

for the construction of
**Interstate 215 at Newport Road
Interchange Project
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)**

Engineering Certification(s) (continued)

Traffic / Electrical



Keith Rand, P.E.

6/11/2014

Date



Architect Certification(s)

The Architecture specifications, special provisions, and estimates have been prepared by or under the direction of the following Registered Architect(s):

Landscape Architect



Jiri George Strnad
Licensed Landscape Architect

6/11/2014

Date



Specification and Contract Documents

for the construction of

Interstate 215 at Newport Road

Interchange Project

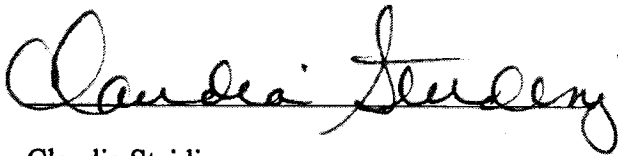
in the City of Menifee

Project No. B5-0682

Federal Aid No. STPLN- 5956(234)

Water Pollution Control – Specifications and Special Provisions

Reviewed and Recommended by:



Claudia Steiding
Senior Transportation Planner/NPDES
Coordinator

6/12/14
Date

County of Riverside

Notice to Bidders

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Bid Bond	10 %	
Performance Bond	100 %	
Payment Bond	100 %	
Working Days	360	

Website: <http://rctlma.org/trans/Contractors-Corner/Notices-Inviting-Bids>

The County of Riverside affirms that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The County of Riverside, in accordance with Title IV of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Department of Commerce (15 C.F.R., Part 8), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the grounds of race, color, or national origin.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates, in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DLSR/PWD>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the bid book and in copies of this book that may be examined at the offices described above where project plans, special provisions, and bid forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of bid book. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the bid book. 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, the Contractor and subcontractors shall 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 the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate, which most closely approximates the duties of the employees in question.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Instructions to Bidders

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Instructions to Bidders

The Bidder's attention is directed to the provisions in Section 2, "Bidding" of the Standard Specifications and Contract Documents, including the Plans and the Special Provisions, for the requirements and conditions which the bidder must observe in the preparation of and the submission of the Bid.

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

Failure of the Bidder to fulfill the requirements of the Instruction to Bidders, General Conditions or Special Provisions for submittals required to be furnished after bid opening may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on a future public works contracts.

In compliance with the Americans with Disabilities Act, persons with disabilities may request reasonable accommodations (including auxiliary aids and services at no cost) to participate in the pre-bid meeting (if scheduled and as designated in the Notice to Bidders) or bid opening meeting (as scheduled in the Notice to Bidders) by contacting Contracts/Bidding Unit at 951-955-6780 or jrjimenez@rctlma.org at least 3 business days before the scheduled event.

To accommodate persons with disabilities, this Bid Book is available in alternate formats upon request.

1. Inspection of Site

Bidder's attention is directed to Section 2-1.30, "Job Site and Document Examination". Bidders must examine the site and acquaint themselves with all conditions affecting the work. By making and submitting a bid, a Bidder warrants that he has made such site examination as the Bidder deems necessary for the condition of the site, its accessibility for materials, workmen and utilities, and for the ability to protect existing surface and subsurface improvements. No claim for allowances, time or money, will be allowed as to such matters.

2. Bidder's Bid Form

The Bid must be made on the Bid forms, which are included in the Contract Documents, and must be completely filled in, dated and signed. Signature(s) provided by the Bidder must be from an authorized officer or agent (see Bidder Data and Signature sheets).

If provision is made for alternate bid schedule(s), all bid schedules must be bid, unless otherwise instructed in the Special Provisions.

All Bid forms shall be obtained from the Riverside County Transportation Department, 3525 14th Street, Riverside, California 92501.

3. Bid Bond

The bidder's bond form described in Section 2-1.34, "Bidder's Security" of the Standard Specifications and this section will be found in the Bid Book's "B" pages and this form is titled as "Bid Bond".

The Bid must be accompanied by a 10% Bid Bond using the form provided in the Bid Book, or a certified check, or cashier's check payable to the order of "County of Riverside", in an amount not less than 10% of the bid amount, inclusive of alternate bid schedule(s). Submitted Bid Bond form must be completely filled in, sealed, dated and signed. Signatures on the Bid Bond must be notarized. Bond shall be provided with an executed Power of Attorney issued by the surety.

4. Non-Collusion Declaration

In conformance with Public Contract Code §7106, a Non-Collusion Declaration is included in the Bid. Bidder Declaration must be submitted using the form provided in the Bid Book and it must be completely filled in, dated and signed. Signatures on the Non-Collusion Declaration must be notarized.

5. Iran Contracting Act, Certification or Exemption

The Department of General Services has published a list of companies who are prohibited from contracting with public entities in California as required by Public Contract Code §2200 through §2208.

The Iran Contracting Act Certification/Exemption form is included in the Bid Book. For projects estimated or Bid, in the amount of \$1,000,000 or more, Bidder must completely fill in, date, sign and submit this form with the Bid documents.

6. Interpretation of Documents

Discrepancies, omissions, ambiguities, requirements likely to cause disputes between trades and similar matters must be promptly brought to the attention of the County in writing. When appropriate, addenda will be issued by the County.

If the Bidder requires clarification or interpretation of the bidding Contract Documents, the Bidder must make a written request to the County by a Request for Information (RFI). All RFIs must be submitted in writing between the hours of 8:00 a.m. and 5:00 p.m. , Monday through Thursday (except holidays), up to, including and no later than the fifth (5th) business day prior to the bid closing deadline, by hand delivery, mail, fax or electronic mail. The County will not respond to RFIs submitted after that time, unless the County determines at its sole discretion that it is in the best interest of the public and the County to do so. RFIs should be addressed and sent to:

County of Riverside
Transportation Department
Attention: Contracts/Bidding Unit
3525 14th Street
Riverside, CA 92501

Facsimile: (951) 955-3164
Electronic mail: jrjimenez@rctlma.org

Any communication by anyone as to RFIs and other project document inquiries, except by Addenda, does not affect the meaning or requirements of the Contract Documents.

7. Quantities

The amount of work to be done and/or materials to be furnished under the Contract, as shown in the Bid, are merely estimates and are not to be taken as an expressed or implied statement that the actual amount of work or materials will correspond to the estimate.

County reserves the right to increase, decrease or entirely eliminate any items from the work and/or materials to be furnished.

Bidders are cautioned against the unbalancing of their bid by prorating project overhead costs only into one, two, or few items when there are various items listed in the bid schedule(s).

The quantities mentioned in Standard Specifications Section 2-1.33B, "Bid Item List and Bid Comparison" will be found in the Bid form.

8. Addenda

County reserves the right to issue Addenda to the Contract Documents at any time prior to the scheduled bid opening date and time. Each potential Bidder must provide the County his company name, contact name, phone number, facsimile number, electronic mail address and company address for the purpose of receiving Addenda.

To be considered responsive, the Bid must list and take into account all issued Addenda.

In addition to listing the acknowledged addenda (if any) on the Bid, Bidders should submit each addendum's acknowledgement signature page and attach each one to the Bid. Attaching all addenda pages and attachments (if any) to the Bid submittal is not necessary for Bid submittal. All Addenda is a component of the Contract Documents.

9. License

To be considered for award of the Contract, a Bidder must have the necessary license(s) required under provisions of the California Business and Professions Code for the scope of work covered in the Contract Documents at the time of bid submission. This includes Joint Ventures.

If a Bidder is a Joint Venture, "Schedule B—Information for Determining Joint Venture Eligibility" form, located within the Additional Federal Requirements section, must be submitted. If a Bidder is a Joint Venture and this information form is not submitted with the bid, the apparent low bidder, the 2nd low bidder, and the 3rd low bidder must complete and submit this form to the County. Joint Venture information form must be received by the County no later than 4:00 p.m. on the 4th business day after bid opening.

Each item of work will be performed by a Contractor that is qualified and properly licensed for that work.

Pursuant to California Labor Code §3099, certification is required for all persons who perform work as electricians for Contractors licensed as Class C10 "Electrical Contractor". Proof of certification must be provided to the County before the start of construction.

10. Contract Participation

County encourages general and prime Contractors to solicit competitive subcontracting, trucking and supplier opportunities to minority, women, disabled veteran, and small business firms where possible, in their contracting and procurement activities with the County.

Section 3-1.08, "Small Business Participation Report", of the Standard Specifications is deleted.

Contractors are advised that the Disadvantaged Business Enterprise (DBE) Program is separate and distinct from a variety of business programs such as Disabled Veterans Business Enterprise (DVBE), Minority Business Enterprise (MBE), Small Business Enterprise (SBE), Women Business Enterprise (WBE), and others. DBE firms must be certified as such in order to qualify under the DBE program.

11. Subletting, Subcontracting, and Subcontractor List

General

Attention is directed to General Conditions Section 12, "Subcontracting".

Pursuant to Public Contract Code § 4100 et seq., "Subletting and Subcontracting Fair Practices Act", Bidders are required to list each subcontractor who will perform work, provide labor, or render services in or about the construction of work or improvement or a subcontractor who specifically fabricates and installs a portion of the work or improvement according to the details contained in the Plans and Specifications. The Subletting and Subcontracting Fair Practice Act applies to all phases of the work.

Subcontractor List

As required by Standards Specification Section 2-1.33C, "Subcontractor List", the Bidder must submit a Subcontractor List. Subcontractor List must be on the form contained in the Bid Book.

Bidder must list each subcontractor to perform work, labor or render service in or about the construction in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.).

Pursuant to Public Contract Code § 6109 et seq., the Contractor shall not perform work on a project with a subcontractor who is ineligible to perform work on the project pursuant to Labor Code § 1777.1 or 1777.7.

The Subcontractor List must show the name, address, license number and work portions to be performed by each subcontractor listed. Work portions must be identified by bid item number and description for each subcontractor listed. An inadvertent error in listing the license number will be processed as required by Public Contract Code § 4104 (a) (2). If partial work is to be performed within a certain construction item or trade, the Bidder/Contractor shall specify the portions of the work to be performed by the different subcontractors or the directive under Public Contract Code § 4106 shall apply.

Each designated item of work will be performed by a Contractor which is qualified and properly licensed for that listed work.

Omission or failure to list a subcontractor for a portion of the work means that the prime Contractor will do that portion of the work (Public Contract Code § 4106).

The County may request additional information to verify submitted Subcontractor List information and percentage amounts. Bidder must provide this information within two (2) business days of request.

Penalties

The Bidder's attention is directed to other provisions of the Subletting and Subcontracting Fair Practices Act related to the imposition of penalties for failure to observe its provisions by utilizing unauthorized subcontractors or by making unauthorized substitutions.

Clerical error

After the Bid Opening, inadvertent subcontractor designation clerical error(s) will be processed as required by Public Contract Code § 4107.5.

DBE note

Bidders are cautioned that this listing requirement is in addition to the requirement to submit a list of all DBE subcontractors after the opening of the Bids.

12. Equal Employment Opportunity Certification

Equal Employment Opportunity Certification must be submitted using the form provided in the Bid Book and it must be completely filled in, checked off as applicable, signed, and dated.

13. Public Contract Code Statements and Questionnaire

Public Contract Code Statements and Questionnaire must be submitted using the form provided in the Bid Book and it must be completely filled in as applicable. These statements and questionnaire are part of the Bid. Signature of Bid constitutes signature of these statements and questionnaire.

14. Debarment and Suspension Certification

Debarment and Suspension Certification must be submitted using the form provided in the Bid Book. This certification is part of the Bid. Signature of Bid constitutes signature of this Certification.

15. Federal Lobbying Restrictions

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier sub recipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the

awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

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

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

The above referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall 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 previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

1. 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
2. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or
3. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal Action.

16. Disadvantaged Business Enterprise (DBE)

Under 49 CFR 26.13(b):

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

Take necessary and reasonable steps to ensure that DBEs have opportunity to participate in the contract (49 CFR 26).

To ensure equal participation of DBEs provided in 49 CFR 26.5, the County shows a goal for DBEs.

Make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers.

Meet the DBE goal shown elsewhere in these Special Provisions or demonstrate that you made adequate good faith efforts to meet this goal.

It is your responsibility to verify that the DBE firm is certified as DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

http://www.dot.ca.gov/hq/bep/find_certified.htm
(Verify that URL still works on a project by project basis.)

All DBE participation will count toward the California Department of Transportation's federally mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs counts towards the goal in the following manner:

1. 100 percent counts if the materials or supplies are obtained from a DBE manufacturer.
2. 60 percent counts if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies count if obtained from a DBE that is neither a manufacturer nor a regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit towards the goal if you employ a DBE trucking company that performs a commercially useful function as defined in 49 CFR 26.55(d)(1) through (4) and (6).

A. DBE Commitment Submittal

Submit Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, form, included in the Bid book. If the form is not submitted with the bid, the form may be removed from the Bid book before submitting your bid.

If the DBE Commitment form is not submitted with the bid, the apparent low bidder, the 2nd low bidder, and the 3rd low bidder must complete and submit the DBE Commitment form to the County. DBE Commitment form must be received by the County no later than 4:00 p.m. on the 4th business day after bid opening.

Other bidders do not need to submit the DBE Commitment form unless the County requests it. If the County requests you to submit a DBE Commitment form, submit the completed form within 4 business days of the request.

Submit written confirmation from each DBE stating that it is participating in the contract. Include confirmation with the DBE Commitment form. A copy of a DBE's quote will serve as written confirmation that the DBE is participating in the contract.

All submittals shall meet the requirements of the bid documents. Corrections, if required, shall be made and the documents shall be resubmitted within 2 business days of Bidder's receipt of review comments.

If you do not submit the DBE Commitment form within the specified time, the County finds your bid non-responsive.

B. Good Faith Efforts Submittal

If you have not met the DBE goal, complete and submit the DBE Information - Good Faith Efforts, Exhibit 15-H, form with the bid showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed towards obtaining participation by DBEs will be considered. If good faith efforts documentation is not submitted with the bid, it must be received by the County no later than 4:00 p.m. on the 4th business day after bid opening.

If your DBE Commitment form shows that you have met the DBE goal or if you are required to submit the DBE Commitment form, you must also submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the County finds that the DBE goal has not been met.

Good faith efforts documentation must include the following information and supporting documents, as necessary:

1. Items of work you have made available to DBE firms. Identify those items of work you might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is your responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
2. Names of certified DBEs and dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. You are reminded to solicit

certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.

3. Name of selected firm and its status as a DBE for each item of work made available. Include name, address, and telephone number of each DBE that provided a quote and their price quote. If the firm selected for the item is not DBE, provide the reasons for the selection.
4. Name and date of each publication in which you requested DBE participation for the project. Attach copies of the published advertisements.
5. Names of agencies and dates on which they were contacted to provide assistance in contacting, recruiting, and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
6. List of efforts made to provide interested DBEs with adequate information about the plans, specifications, and requirements of the contract to assist them in responding to a solicitation. If you have provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.
7. List of efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials, excluding supplies and equipment that the DBE subcontractor purchases or leases from the prime contractor or its affiliate. If such assistance is provided by you, identify the name of the DBE assisted, nature of the assistance offered, and date assistance was provided. Provide copies of supporting documents, as appropriate.
8. Any additional data to support demonstration of good faith efforts.

The County may consider DBE commitments of the 2nd and 3rd bidders when determining whether the low bidder made good faith efforts to meet the DBE goal.

C. DBE Information Attachment, Bids Received by Bidders

Submit Local Agency Bidder – DBE Information Attachment form included in the Bid book. If the form is not submitted with the bid, remove the form from the Bid book before submitting your bid.

If the “Local Agency Bidder – DBE Information Attachment” form is not submitted with the bid, the apparent low bidder, second low bidder and third low bidder must complete and submit the DBE Information form to the County. Other bidders do not need to submit the DBE Information Attachment form unless the County requests it. If the County requests you to submit a DBE Information Attachment form, submit the completed Attachment form within 4 business days of the request.

Bidder information is required for DBE and non-DBE firms. Bidder information shall be furnished, using this form, for each supplier, trucking firm and sub-contract bid/proposal that the apparent low bidder, second low bidder and third low bidder received pertaining to the reference project, whether or not the bidding supplier, trucking firm or sub-contractor was awarded work by the apparent low bidder, and whether or not the bid/proposal was solicited by the apparent low bidder. This information shall be submitted by the apparent low bidder as an Attachment to the completed "Local Agency Bidder - DBE Commitment (Construction Contracts), Exhibit 15-G" form.

17. Subcontractor and DBE Records

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

The County requests the Contractor to:

1. Notify the Engineer of any changes to its anticipated DBE participation
2. Provide this notification before starting the affected work

Maintain records including:

1. Name and business address of each 1st-tier subcontractor
2. Name and business address of each DBE subcontractor, DBE vendor, and DBE trucking company, regardless of tier
3. Date of payment and total amount paid to each business

If you are a DBE contractor, include the date of work performed by your own forces and the corresponding value of the work.

Before the 15th of each month, submit a Monthly DBE Trucking Verification form, Exhibit 16-Z (See Special Provision Section 6 attachments).

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. On work completion, complete a Disadvantaged Business Enterprises (DBE) Certification Status Change, Exhibit 17-O, form (See Special Provision Section 6 attachments). Submit the form within 30 days of contract acceptance.

Upon work completion, complete a Final Report - Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors, Exhibit 17-F, form (See Special Provision Section 6 attachments). Submit it within 90 days of contract acceptance. The County

withholds \$10,000 until the form is submitted. The County releases the withhold upon submission of the completed form.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. If the DBE leases trucks from a non-DBE, the Contractor may count only the fee or commission the DBE receives as a result of the lease arrangement.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month. This documentation shall be submitted on "Monthly DBE Trucking Verification" Form CEM-2404(F) (See "Additional Federal Requirements Exhibits", Appendix E).

18. Performance of DBE

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

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or obtain materials from other sources without authorization from the County.

The County authorizes a request to use other forces or sources of materials if it shows any of the following justifications:

1. Listed DBE fails or refuses to execute a written contract based on plans and specifications for the project.
2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
3. Work requires a contractor's license and listed DBE does not have a valid license under Contractors License Law.
4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
5. Listed DBE's work is unsatisfactory and not in compliance with the contract.
6. Listed DBE is ineligible to work on the project because of suspension or debarment.
7. Listed DBE becomes bankrupt or insolvent.
8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. County determines other documented good cause.

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the

County of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

1. 1 or more of the reasons listed in the preceding paragraph
2. Notices from you to the DBE regarding the request
3. Notices from the DBEs to you regarding the request

If a listed DBE is terminated, make good faith efforts to find another DBE to substitute for the original DBE. The substitute DBE must perform at least the same amount of work as the original DBE under the contract to the extent needed to meet the DBE goal.

The substitute DBE must be certified as a DBE at the time of request for substitution.

Unless the County 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 County 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.

19. DBE Certification Status

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, "Disadvantaged Business Enterprises (DBE) Certification Status Change" Form CEM-2403 (F) (See Special Provision Section 6, Attachment, Caltrans LAPM, Exhibit 17-O) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

It is your responsibility to verify that the DBE firm is certified as DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

http://www.dot.ca.gov/hq/bep/find_certified.htm

20. Hours of Work

Attention is directed to Section 8-1.05, "Time" and Section 7-1.02K(5), "Working Hours" of the Standard Specifications.

Daily working hours will be between the hours of **7:00 a.m. and 6:00 p.m.**, Monday through Friday, except legal holidays, or as revised in the Special Provisions, and as approved by the

Engineer. Exceptions and specific work schedules must be submitted in writing to the Engineer for consideration.

21. Alternate Bid Schedules

If the Bid includes bid items listed under a Base Bid Schedule and one or more Alternate Bid Schedules, the following will apply:

The County may award only the items of work listed on the Base Bid Schedule, or may choose to award some or all of the Alternate Bid Schedules in addition to the Base Bid Schedule. Unless otherwise specified, the basis of the selection of the lowest bid will be the lowest responsive and responsible bid for the sum of all Bid Schedules.

If the Bid includes bid items listed under two or more Alternate Bid Schedules with no Base Bid Schedule, the following will apply:

This project contains Alternate Bid Schedules that may or may not be mutually exclusive, as described elsewhere in the bid documents. The County may award the items of work listed on one or more of the Alternate Bid Schedules. In the case of mutually exclusive Alternate Bid Schedules, only one of the Alternate Bid Schedules will be selected for award. Unless otherwise specified, the basis of the selection of the lowest bid will be the lowest responsive and responsible bid for the sum of all Bid Schedules.

The County reserves the right to reject all bids received.

22. Bids

No Bidder may withdraw their bid for a period of ninety (90) calendar days after the bid opening.

Bids are required for the entire work, including all alternate bid schedules, if applicable, unless otherwise explicitly allowed in the bid documents. The amount of the bid, for comparison purposes, will be the total of all items. The total of unit basis items will be determined by extension of the item price bid on the basis of the estimated quantity set forth for the item.

The Bidder must set forth for each item of work in clearly legible figures, an item price and a total for the item in the respective spaces provided for this purpose. In the case of unit basis items, the amount set forth under the "Total" column will be the extension of the item price bid on the basis of the estimated quantity for the item.

In the case of a discrepancy between the unit price and the total set forth for a unit basis item, the unit price will prevail, in (1) or (2), as follows:

1. If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item "Total" column, then the amount set forth in the item "Total" column for the item shall be divided by the estimated quantity for the item and the price thus obtained will be the unit price.
2. (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 County's final estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise if the item total for a Lump Sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid amount is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or Lump Sums. Written unit prices, item totals and Lump Sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cents symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar.

Bids on Lump Sum items shall be item totals only; if any unit price for a Lump Sum item is included in a bid and it differs from the item total, the items total shall prevail.

The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the County, and that discretion will be exercised in the manner deemed by the County to best protect the public interest in the prompt and economical completion of the work. The decision of the County respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, including determination of non-responsiveness, shall be final.

The County hereby reserves the right to reject any and all bids, to waive any irregularity, and to award the Contract to other than the lowest bidder.

23. Like Bid Items

The Bidder is advised that the items of work may be grouped into bid schedules, and that certain bid items may be listed in more than one bid schedule, and listed with different bid item numbers, and the following will apply thereto:

The Bidder is directed to submit the same bid amount for all bid items that are listed with the same item code and item description. Said bid items are referred to herein as "Like Bid Items".

"Like Bid Items" will be considered a single bid item for purposes of calculating increased and decreased quantities, and as otherwise applicable in Section 4-1.05, "Changes and Extra Work" of the Standard Specifications.

The following are not subject to this bidding requirement:

1. Bid items with the same item code but different item descriptions.
2. Bid items that are measured as "Lump Sum" or "Force Account".
3. Alternate Bid Schedules.

In the event that a Bidder submits different unit bid amounts for "Like Bid Items", as described above, the bid will be corrected by applying the lowest of the unit bid amounts to all the respective "Like Bid Items".

24. Contract Documents

The complete Contract Documents are identified below. Potential Bidders are cautioned that the successful Bidder incurs duties and obligations under all of the Contract Documents and that they should not merely skim and hastily review the Plans and Specifications in making their bid.

The entire Contract consists of the following documents:

- a) Construction Contract,
- b) Notice to Bidders,
- c) Bid (including all Page "B" Bidding Documents),
- d) Bid Bond (The Bid Bond is exonerated upon execution of the Contract and the Payment Bond and Performance Bond.),
- e) Payment Bond,
- f) Performance Bond,
- g) Standard Specifications of the State of California Department of Transportation edition of 2010 as modified in other portions of the Contract Documents and as amended by the State of California Department of Transportation,
- h) Special Provisions,
- i) Bid Book Appendices, including but not limited to AQMD Recommendations, Reference Drawings, and Exhibits,
- j) Standard Plans of the Department of Transportation identified on the plans or in the Special Provisions,
- k) The Plans,

- l) All issued Addenda,
- m) Determination of Prevailing Wage Rates for Public Works,
- n) Federal Wage Prevailing Wage Decision,
- o) Additional Federal Requirements and forms included with in the Special Provisions,
- p) Supplemental Information listed in the Special Provision,
- q) Any Change Orders issued,
- r) Any additional or supplemental specifications, notice, instructions and drawings issued in accordance with the provisions of the Contract Documents.

All listed Contract Documents are incorporated in the Contract. Any other documents properly issued after award of the Contract shall likewise be deemed incorporated in the Contract.

25. Submission of Bidder's Bid

A Bidder's Bid must be submitted in a sealed opaque envelope that clearly identifies the Bidder's name and the project name. Bids must be received before the scheduled date and time at the location set forth in the Notice to Bidders and may be withdrawn only as stated in the Bid. Bids must be completed in ink.

26. Qualifications of Bidders

No award will be made to any Bidder who cannot give satisfactory assurance to the Board of Supervisors as to his own ability to carry out the Contract, both from his financial standing and by reason of his previous experience as a Contractor on work of the nature contemplated in the Contract. The Bidder may be required to submit his record of work of similar nature to that proposed under these specifications and unfamiliarity with the type of work may be sufficient cause for rejection of bid.

27. Award of Contract

The Bidder's attention is directed to the provisions in Section 3, "Contract Award and Execution" of the Standard Specifications and the Instruction to Bidders for the requirements and conditions concerning award and execution of Contract.

Section 3-1.04, "Contract Award" of the Standard Specifications is deleted.

The last sentence of Section 2-1.24, "Tied Bid Resolution", is deleted and replaced with:

After bid verification, the County will select one of the tied bids of its choice (Public Contract Code § 22038.2.b).

The award of the Contract, if it be awarded, will be to the lowest responsible bidder whose bid complies with all the requirements prescribed.

The County reserves the right to reject all bids received.

Acceptance, by the governing body of the County by resolution or minute order at a meeting regularly called and held, of a Bid constitutes an award of the Contract and the execution of the Contract is a written memorial thereof.

The County will submit the Contract Documents to the low responsive and responsible Bidder for execution prior to award utilizing the following procedures and requirements:

- A. A Bidder whose Bid is accepted must execute the formal construction Contract with the County, similar to the form attached hereto as a sample, and must return said Contract, together with approved Performance Bond and Payment Bond and with complete evidence of insurance as required elsewhere herein, including executed additional insured endorsements and waivers of subrogation, within ten (10) business days from the date of the Notice of Acceptance of Bid and Intent to Award as issued by the Transportation Department. All submittals must meet the requirements of the bid documents. Corrections, if required, must be made and the revised documents must be resubmitted within two (2) business days of Contractor's receipt of review comments.
- B. The bonds and insurance documentation must be submitted in accordance with the Contract Document requirements prior to submission to the County of Riverside Board of Supervisors for award by the Transportation Department and prior to the performance of any work under the Contract.
- C. If a Bidder to whom a Notice of Acceptance of Bid and Intent to Award has been issued, fails or refuses to sign a construction Contract, or to furnish the bonds or insurance certificates and endorsements as required within the prescribed period of time as described above, the County may, at its sole discretion, rescind the Notice of Acceptance, and the bid guarantee submitted by that Bidder will become the property of the County as prescribed in the bid documents and as allowed by law.
- D. If it is in the best interest of the County, the County reserves the right to award the Contract prior to execution by the Contractor. Thereafter, County will mail or deliver the County signed Contract to the awarded Contractor for execution and return.

Bid Protest

Any Bidder submitting a bid to County may file a protest of the County's proposed Award of the Contract provided that each and all of the following are complied with:

1. The bid protest is in writing.

2. The bid protest is filed with and received by County of Riverside Transportation and Land Management Agency at the following address:

County of Riverside
Transportation Department
Attention: Contracts/Bidding Unit
3525 14th Street
Riverside, CA 92501

Facsimile: (951) 955-3164
Electronic mail: jrjimenez@rctlma.org

3. The bid protest is filed with and received not more than five (5) calendar days following the date of issuance of the Notice of Intent to Award. Notice of Intent to Award letter is posted on the County of Riverside Transportation Department website along with the project bid summary. URL for this webpage is http://www.rctlma.org/trans/con_bid_summaries.html. Failure to timely file and serve the bid protest as aforesated shall constitute grounds for the County's denial of the bid protest without consideration of the grounds stated therein.
4. The written bid protest sets forth, in detail, all grounds for the bid protest, including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the bid protest. Any grounds not set forth in the bid protest shall be deemed waived. All factual contentions must be supported by competent, admissible and credible evidence. Any bid protest not conforming to the foregoing shall be rejected as invalid.
5. Provided that a bid protest is filed in conformity with the foregoing, the Director of TLMA, or such individual(s) as may be designated by the Director in his discretion, shall review and evaluate the basis of the bid protest, and shall provide a written decision to the Bidder submitting the bid protest, either concurring with or denying the bid protest. The written decision of the Director or his designee shall be final, unless overturned by the Board of Supervisors.

28. Payment and Performance Bonds

The County requires a 100% Payment Bond and 100% Performance Bond from the successful Bidder. All bonds must be on County's forms contained in the Bid Book.

The bonds must be underwritten by a Surety Company, which is admitted to transact the business of insurance in the State of California, and which carries a rating in the current issue of Best's Insurance Guide of "A" or better with a financial size of at least "VIII". The bond forms included in the Bid Book must be used. All signatures on the bonds must be notarized. Bonds must be provided with an executed Power of Attorney issued by the Surety.

29. Return of Bid Guarantee

Standard Specification Section 3-1.19, "Bidder's Securities" is deleted.

Bid bonds will not be returned unless specifically requested by the Bidder in writing. Any submitted negotiable securities of unsuccessful Bidders will be returned by mail within 30 days of the award of a contract to the successful Bidder. Any submitted negotiable security of the successful Bidder will be returned by mail within 30 calendar days of acceptable receipt of executed Contract, certificate of insurance, Performance Bond and Payment Bond.

30. Submission of Insurance Certificate and Endorsements

Attention is directed General Conditions Section 4 "Insurance and Hold Harmless."

Within ten (10) working days of the date of the Notice of Acceptance of Bid and Intent to Award issued by the County, the successful Contractor must submit a certificate of insurance, including required endorsements, which provides evidence that the bidding Contractor has insurance coverage that meets the requirements of General Conditions "Insurance and Hold Harmless" section. Failure to have complete insurance coverage in place and to provide all required certificates and endorsements within the specified ten (10) business day period will be grounds to declare the Bidder as non-compliant with the bid documents, rescinding the Notice of Acceptance, making a claim against the bid bond, and awarding to the second low Bidder, at the sole discretion of the County.

Bidding Documents

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Bid

Date: _____

To: County of Riverside, hereafter called "County";

Bidder: _____
(hereafter called "Contractor")

The undersigned, Contractor, having carefully examined the site and the Contract Documents for the construction of **Interstate 215 at Newport Road, Interchange Improvements, in the City of Menifee, Project No. B5-0682, Federal Aid No. STPLN- 5956(234)** hereby proposes to construct the work in accordance with the Contract Documents, including **Addenda Number(s)** _____ (Fill in addenda numbers if addenda have been issued.) for the amount stated in this Bid.

By submitting this Bid, Contractor agrees with County:

1. That unless withdrawn in person by Contractor or some person authorized in writing by Contractor (not by telephone or facsimile) before the time specified in the Notice Inviting Bids for the public opening of bids, this Bid constitutes an irrevocable offer for 90 calendar days after that date.
2. County has the right to reject any or all Bids and to waive any irregularities or informalities contained in a Bid.
3. To execute the Contract and deliver the Performance Bond, Payment Bond and Insurance Certificate with endorsements, that comply with the requirements set forth in the Instruction to Bidders and General Conditions (Special Provisions?), within ten (10) business days of the date of the Notice of Acceptance of Bid and Intent to Award as issued by the County.
4. That the contract shall be awarded upon a resolution or minute order to that effect duly adopted by the governing body of County; and that execution of the Contract shall constitute a written memorial thereof.
5. To submit to the County such information as County may require determining whether a particular Bid is the lowest responsible bid submitted.
6. That the accompanying Bid Bond, certified check or cashier's check is in an amount not less than 10% of the total bid submitted and constitutes a guarantee that if awarded the contract, Contractor will execute the Contract and deliver the required bonds within ten (10) business days after notice of award. If Contractor fails to execute and deliver said documents, the bond or check is to be charged with the costs of the resultant damages to the County, including but not limited to: publication costs, the difference in money between the amount bid and the amount in excess of the bid which it costs County to do or cause to be done for the work involved, lease and rental costs, additional salaries and overhead, increased interest and costs of funding the project, attorney expense, additional engineering and architectural expense and cost of maintaining or constructing alternate facilities occasioned by the failure to execute and deliver said documents.
7. By signing this Bid the Contractor certifies that the representations made therein are made under penalty of perjury.

**Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)**

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
1	170101	DEVELOP WATER SUPPLY	LS	1		
2	066016	JUST-IN-TIME TRAINING	LS	1		
3	066017A	COURSE OF CONSTRUCTION INSURANCE	LS	1		
4	066105A	RESIDENT ENGINEERS OFFICE	LS	1		
5	070030	LEAD COMPLIANCE PLAN	LS	1		
6	080050	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	1		
7	120090	CONSTRUCTION AREA SIGNS	LS	1		
8	120100	TRAFFIC CONTROL SYSTEM	LS	1		
9	120116	TYPE II BARRICADE	EA	5		
10	120120	TYPE III BARRICADE	EA	9		
11	120165	CHANNELIZER (SURFACE MOUNTED)	EA	660		
12	120300	TEMPORARY PAVEMENT MARKER	EA	2,790		
13	128601A	TEMPORARY SIGNAL SYSTEM (LOCATION 1)	LS	1		
14	128602A	TEMPORARY SIGNAL SYSTEM (LOCATION 2)	LS	1		
15	128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	EA	10		
16	129000	TEMPORARY RAILING (TYPE K)	LF	37,800		
17	129100	TEMPORARY CRASH CUSHION MODULE	EA	320		
18	129150	TEMPORARY TRAFFIC SCREEN	LF	37,800		
19	130100	JOB SITE MANAGEMENT	LS	1		
20	130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	1		
21	130330	STORM WATER ANNUAL REPORT	EA	2		
22	130570	TEMPORARY COVER	SQYD	3,030		
23	130560	TEMPORARY SOIL BINDER	SQYD	173,000		
24	130610	TEMPORARY CHECK DAM	LF	630		
25	130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	62		
26	130640	TEMPORARY FIBER ROLL	LF	58,800		
27	130650	TEMPORARY GRAVEL BAG BERM	LF	1,520		
28	130680	TEMPORARY SILT FENCE	LF	14,200		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
29	130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	12		
30	130720	TEMPORARY CONSTRUCTION ROADWAY	SQYD	300		
31	130730	STREET SWEEPING	LS	1		
32	130900	TEMPORARY CONCRETE WASHOUT	LS	1		
33	130901A	TEMPORARY STREAM CROSSING	LS	1		
34	130902A	TEMPORARY CLEAR WATER DIVERSION	LS	1		
35	141000	TEMPORARY FENCE (TYPE ESA)	LF	2,610		
36	141120	TREATED WOOD WASTE	LB	8,740		
37	148005	NOISE MONITORING	LS	1		
38	150204	ABANDON CULVERT	LF	39		
39	150608	REMOVE CHAIN LINK FENCE	LF	3,630		
40	150658A	REMOVE TEMPORARY TERMINAL SECTION (TYPE K)	EA	2		
41	150661	REMOVE GUARDRAIL	LF	230		
42	150668	REMOVE FLARED END SECTION	EA	15		
43	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	58,000		
44	150712	REMOVE PAINTED PAVEMENT MARKING	SQFT	2,960		
45	150722	REMOVE PAVEMENT MARKER	EA	1,240		
46	150742	REMOVE ROADSIDE SIGN	EA	63		
47	150757	REMOVE SIGN STRUCTURE	EA	2		
48	150770	REMOVE ASPHALT CONCRETE PAVEMENT	SQFT	14,500		
49	150801	REMOVE OVERSIDE DRAIN	EA	5		
50	150802A	REMOVE ROCK SLOPE PROTECTION	CY	140		
51	150809	REMOVE CULVERT	LF	1,360		
52	150814	REMOVE DOWNDRAIN	EA	2		
53	150820	REMOVE INLET	EA	10		
54	150832	REMOVE RETAINING WALL	CY	2		
55	152390	RELOCATE ROADSIDE SIGN	EA	8		
56	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	87,800		
57	153121	REMOVE CONCRETE	CY	81		
58	153123A	REMOVE CONCRETE (CROSS GUTTER)	SQYD	190		
59	153130	REMOVE CONCRETE CURB	LF	3,730		
60	153140	REMOVE CONCRETE SIDEWALK	SQYD	3,240		
61	153215	REMOVE CONCRETE (CURB AND GUTTER)	LF	4,640		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
62	153221	REMOVE CONCRETE BARRIER	LF	380		
63	153229	REMOVE CONCRETE BARRIER (TYPE K)	LF	2,060		
64	155007	CAP MANHOLE	EA	1		
65	156585	REMOVE CRASH CUSHION	EA	3		
66	157550	BRIDGE REMOVAL	LS	1		
67	157561	BRIDGE REMOVAL (PORTION), LOCATION A	LS	1		
68	157562	BRIDGE REMOVAL (PORTION), LOCATION B	LS	1		
69	160102	CLEARING AND GRUBBING	LS	1		
70	190101 (F)	ROADWAY EXCAVATION	CY	159,000		
71	192003 (F)	STRUCTURE EXCAVATION (BRIDGE)	CY	4,162		
72	192037 (F)	STRUCTURE EXCAVATION (RETAINING WALL)	CY	2,937		
73	192060 (F)	STRUCTURE EXCAVATION (GROUND ANCHOR WALL)	CY	234		
74	193003 (F)	STRUCTURE BACKFILL (BRIDGE)	CY	2,117		
75	193013 (F)	STRUCTURE BACKFILL (RETAINING WALL)	CY	5,701		
76	193027 (F)	STRUCTURE BACKFILL (GROUND ANCHOR WALL)	CY	26		
77	193031 (F)	PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	CY	244		
78	193118 (F)	CONCRETE BACKFILL	CY	1.2		
79	198010	IMPORTED BORROW	CY	180,000		
80	200114	ROCK BLANKET	SQYD	8,020		
81	200002	ROADSIDE CLEARING	LS	1		
82	202037	ORGANIC FERTILIZER	LB	48		
83	204011A	PLANT (GROUP K) (48" BOX)	EA	16		
84	204099	PLANT ESTABLISHMENT WORK [PER MONTH]	EA	36		
85	205035	WOOD MULCH	CY	2.4		
86	206559	CONTROL AND NEUTRAL CONDUCTORS (ARMOR-CLAD)	LS	1		
87	206562 (P)	1" REMOTE CONTROL VALVE	EA	1		
88	206631	1" WYE STRAINER ASSEMBLY	EA	1		
89	206762 (P)	30-42 STATION IRRIGATION CONTROLLER (PEDESTAL MOUNTED)	EA	4		
90	208304	WATER METER	EA	1		
91	208423 (P)	1" BACKFLOW PREVENTER ASSEMBLY	EA	1		
92	208440 (P)	BACKFLOW PREVENTER ENCLOSURE	EA	1		
93	208442 (P)	FLOW SENSOR	EA	1		
94	208445 (P)	TREE WELL SPRINKLER ASSEMBLY	EA	48		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
95	208572 (P)	1" GATE VALVE	EA	5		
96	208594 (P-F)	3/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	2,174		
97	208595 (P-F)	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	436		
98	208610A (P-F)	1 1/2" PLASTIC PIPE (CLASS 315) (SUPPLY LINE)	LF	1,134		
99	208768 (P-F)	12" BITUMINOUS COATED CORRUGATED STEEL PIPE CONDUIT (0.064" THICK)	LF	852		
100	210010	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	6		
101	210270	ROLLED EROSION CONTROL PRODUCT (NETTING)	SQFT	12,400		
102	210300	HYDROMULCH	SQFT	869,000		
103	210420	STRAW	SQFT	869,000		
104	210430	HYDROSEED	SQFT	882,000		
105	210600	COMPOST	SQFT	882,000		
106	260203	CLASS 2 AGGREGATE BASE	CY	5,850		
107	280000	LEAN CONCRETE BASE	CY	7,920		
108	390011	PREPAVING INERTIAL PROFILER	LS	1		
109	390129	HOT MIX ASPHALT (TYPE C)	TON	9,450		
110	390132	HOT MIX ASPHALT (TYPE A)	TON	6,740		
111	390137	RUBBERIZED HOT MIX ASPHALT (GAP GRADED)	TON	4,770		
112	394053	SHOULDER RUMBLE STRIP (HMA, GROUND-IN INDENTATIONS)	STA	7		
113	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	61		
114	395000	LIQUID ASPHALT (PRIME COAT)	TON	210		
115	397005	TACK COAT	TON	61		
116	401050	JOINTED PLAIN CONCRETE PAVEMENT	CY	20,000		
117	401083	SHOULDER RUMBLE STRIP (CONCRETE PAVEMENT, GROUND-IN INDENTATIONS)	STA	58		
118	414202	JOINT SEAL (PREFORMED COMPRESSION)	LF	73,400		
119	414241	ISOLATION JOINT SEAL (SILICONE)	LF	13,900		
120	460210 (P)	GROUND ANCHOR (SUBHORIZONTAL)	EA	66		
121	490528 (P)	FURNISH STEEL PILING (HP 14 X 89)	LF	5,518		
122	490529	DRIVE STEEL PILE (HP 14 X 89)	EA	110		
123	490601	16" CAST-IN-DRILLED-HOLE CONCRETE PILING	LF	2,590		
124	490603	24" CAST-IN-DRILLED-HOLE CONCRETE PILING	LF	2,970		
125	498052	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	73		
126	500001 (P)	PRESTRESSING CAST-IN-PLACE CONCRETE	LB	86,201		
127	510051 (F)	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	845		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
128	510053 (F)	STRUCTURAL CONCRETE, BRIDGE	CY	2,938		
129	510060 (F)	STRUCTURAL CONCRETE, RETAINING WALL	CY	1,731		
130	510086 (F)	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE N)	CY	200		
131	510090 (F)	STRUCTURAL CONCRETE, BOX CULVERT	CY	2,806		
132	510501 (F)	MINOR CONCRETE	CY	51		
133	510502 (F)	MINOR CONCRETE (MINOR STRUCTURE)	CY	106		
134	511036 (F)	ARCHITECTURAL SURFACE (BARRIER)	SQFT	1,601		
135	511064 (F)	FRACTURED RIB TEXTURE	SQFT	17,560		
136	511106	DRILL AND BOND DOWEL	LF	96		
137	519100 (P)	JOINT SEAL (MR 2")	LF	184		
138	520102 (P-F)	BAR REINFORCING STEEL (BRIDGE)	LB	1,107,255		
139	520103 (P-F)	BAR REINFORCING STEEL (RETAINING WALL)	LB	292,533		
140	520107 (P-F)	BAR REINFORCING STEEL (BOX CULVERT)	LB	458,209		
141	530100	SHOTCRETE	CY	68		
142	560218 (F)	FURNISH SIGN STRUCTURE (TRUSS)	LB	55,930		
143	560219 (F)	INSTALL SIGN STRUCTURE (TRUSS)	LB	55,930		
144	560244	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	490		
145	560248	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	1,000		
146	560249	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	460		
147	560251	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	200		
148	560252	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-FRAMED)	SQFT	220		
149	562004	METAL (RAIL MOUNTED SIGN)	LB	160		
150	566011	ROADSIDE SIGN - ONE POST	EA	110		
151	566012	ROADSIDE SIGN - TWO POST	EA	10		
152	568001	INSTALL SIGN (STRAP AND SADDLE BRACKET METHOD)	EA	1		
153	568015	INSTALL SIGN (MAST-ARM HANGER METHOD)	EA	9		
154	568023	INSTALL ROADSIDE SIGN (LAMINATED WOOD BOX POST)	EA	2		
155	620100 (P)	18" ALTERNATIVE PIPE CULVERT	LF	1,435		
156	620140 (P)	24" ALTERNATIVE PIPE CULVERT	LF	383		
157	620184A (P)	33" ALTERNATIVE PIPE CULVERT	LF	13		
158	650014 (P)	18" REINFORCED CONCRETE PIPE	LF	167		
159	650018 (P)	24" REINFORCED CONCRETE PIPE	LF	1,300		
160	650022 (P)	30" REINFORCED CONCRETE PIPE	LF	28		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
161	650026 (P)	36" REINFORCED CONCRETE PIPE	LF	180		
162	700617	DRAINAGE INLET MARKER	EA	9		
163	703233	GRATED LINE DRAIN	LF	70		
164	705311	18" ALTERNATIVE FLARED END SECTION	EA	4		
165	705315	24" ALTERNATIVE FLARED END SECTION	EA	3		
166	707117	36" PRECAST CONCRETE PIPE INLET	LF	36		
167	707217	36" PRECAST CONCRETE PIPE MANHOLE	LF	52		
168	721013 (F)	ROCK SLOPE PROTECTION (1/4T, METHOD B)	CY	479		
169	721015 (F)	ROCK SLOPE PROTECTION (LIGHT, METHOD B)	CY	829		
170	721028 (F)	ROCK SLOPE PROTECTION (NO. 2, METHOD B)	CY	284		
171	721430	CONCRETE (CHANNEL LINING)	CY	380		
172	721431	CONCRETE (CONCRETE APRON)	CY	7		
173	729011 (P)	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	1,381		
174	730070	DETECTABLE WARNING SURFACE	SQFT	52		
175	730020	MINOR CONCRETE (CURB)	CY	310		
176	730040	MINOR CONCRETE (GUTTER)	LF	91		
177	730045	MINOR CONCRETE (GUTTER)	CY	40		
178	731507	MINOR CONCRETE (GUTTER DEPRESSION)	CY	24		
179	731511	MINOR CONCRETE (ISLAND PAVING)	CY	3		
180	731521	MINOR CONCRETE (SIDEWALK)	CY	230		
181	731623	MINOR CONCRETE (CURB RAMP)	CY	15		
182	750001 (P-F)	MISCELLANEOUS IRON AND STEEL	LB	15,022		
183	750501 (P-F)	MISCELLANEOUS METAL (BRIDGE)	LB	6,757		
184	750505 (P-F)	BRIDGE DECK DRAINAGE SYSTEM	LS	1		
185	800103	TEMPORARY FENCE (TYPE CL-6)	LF	4,070		
186	800310 (P)	CHAIN LINK FENCE (TYPE CL-3.5)	LF	395		
187	800360 (P)	CHAIN LINK FENCE (TYPE CL-6)	LF	4,534		
188	802520 (P)	6' CHAIN LINK GATE (TYPE CL-6)	EA	4		
189	802620 (P)	16' CHAIN LINK GATE (TYPE CL-6)	EA	1		
190	820107	DELINEATOR (CLASS 1)	EA	96		
191	832005 (P)	MIDWEST GUARDRAIL SYSTEM	LF	1,934		
192	832070	VEGETATION CONTROL (MINOR CONCRETE)	SQYD	950		
193	833000 (P-F)	METAL RAILING	LF	603		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
194	833077	PEDESTRIAN BARRICADE	EA	3		
195	833142 (F)	CONCRETE BARRIER (TYPE 26 MODIFIED)	LF	345		
196	839521 (P-F)	CABLE RAILING	LF	202		
197	839543 (P)	TRANSITION RAILING (TYPE WB-31)	EA	6		
198	839576	END CAP (TYPE A)	EA	1		
199	839578	END CAP (TYPE TC)	EA	6		
200	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	10		
201	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	8		
202	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	7		
203	839701	CONCRETE BARRIER (TYPE 60)	LF	81		
204	839703	CONCRETE BARRIER (TYPE 60C)	LF	170		
205	839704	CONCRETE BARRIER (TYPE 60D)	LF	130		
206	839709	CONCRETE BARRIER (TYPE 60GE)	LF	380		
207	839717 (F)	CONCRETE BARRIER (TYPE 732 MODIFIED)	LF	781		
208	839726 (F)	CONCRETE BARRIER (TYPE 736A)	LF	724		
209	839727 (F)	CONCRETE BARRIER (TYPE 736 MODIFIED)	LF	89		
210	839729A (F)	CONCRETE BARRIER (TYPE 736A MODIFIED)	LF	325		
211	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	2,280		
212	840560	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)	LF	123,000		
213	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	135,000		
214	840666	PAINT PAVEMENT MARKING (2-COAT)	SQFT	3,810		
215	850101 (P)	PAVEMENT MARKER (NON-REFLECTIVE)	EA	2,636		
216	850111 (P)	PAVEMENT MARKER (RETROREFLECTIVE)	EA	2,496		
217	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	1		
218	860251 (P)	SIGNAL AND LIGHTING (LOCATION 1)	LS	1		
219	860252 (P)	SIGNAL AND LIGHTING (LOCATION 2)	LS	1		
220	860402 (P)	LIGHTING (CITY STREET)	LS	1		
221	861101	RAMP METERING SYSTEM (LOCATION 1)	LS	1		
222	861102	RAMP METERING SYSTEM (LOCATION 2)	LS	1		
223	861103	RAMP METERING SYSTEM (LOCATION 3)	LS	1		
224	861104	RAMP METERING SYSTEM (LOCATION 4)	LS	1		
225	861497	MODIFY SIGNAL AND LIGHTING (LOCATION 1)	LS	1		
226	861498	MODIFY SIGNAL AND LIGHTING (LOCATION 2)	LS	1		

PROPOSAL

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
BASE BID						
227	861504	MODIFY LIGHTING AND SIGN ILLUMINATION	LS	1		
228	862000A	COMMUNICATION SYSTEM	LS	1		
229	999990	MOBILIZATION	LS	1		
230	066100	DUST CONTROL	LS	1		
231	015602	FUNDING AWARENESS SIGN	EA	2		

BASE BID SUB TOTAL: _____ \$ _____
 ITEMS 1-231 "WORDS"

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
ALTERNATE BID SCHEDULE 1 - THE GAS COMPANY						
232	510100A (P)	12" WELDED STEEL PIPE CASING (BRIDGE)	LS	1		

ALTERNATE BID
 SCHEDULE 1
 SUB TOTAL: _____ \$ _____
 ITEM 232 "WORDS"

ITEM No.	ITEM CODE	ITEM	UNIT	ESTIMATED QUANTITY	ITEM PRICE (IN FIGURES)	TOTAL (IN FIGURES)
ALTERNATE BID SCHEDULE 2 - EASTERN MUNICIPAL WATER DISTRICT						
233	760081A	PERMANENT WATERLINE FACILITIES (LOCATION A AND B)	LS	1		
234	760082A	PERMANENT WATERLINE FACILITIES (LOCATION C)	LS	1		

ALTERNATE BID
 SCHEDULE 2
 SUB TOTAL: _____ \$ _____
 ITEMS 233-234 "WORDS"

PROJECT TOTAL
 (BASE BID, ALTERNATE BID SCHEDULE 1 AND ALTERNATE BID SCHEDULE 2):
 _____ \$ _____
 ITEMS 1-234 "WORDS"

Bidder Data and Signature

Name of Bidder: _____

Type of organization: _____

Person(s) authorized to sign for Bidder: _____

Note:

If Bidder is a **Corporation**, state legal name of Corporation and also names of the president, vice-president, secretary, treasurer and manager thereof.

If Bidder is a **Co-Partnership**, state true name of firm and also names of all individual co-partners composing firm.

If Bidder is a sole proprietorship or an **Individual**, state first and last name(s) in full.

If Bid is signed by an agent other than an owner, partner or corporate officer, Bid shall be accompanied by a power-of-attorney.

Business Street Address: _____
(Please include business address even if P.O. Box is used.)

Business City, State, Zip Code: _____

P.O. Box- Number: _____

P.O. Box- City, State, Zip Code: _____

Phone: (_____) _____

Facsimile: (_____) _____

E-mail: _____

Contractor's license number: _____

License Classification(s): _____

Expiration date: _____

Bidder Data and Signature (continued)

Accompanying this Bid is a certified check, cashier check or bid bond in an amount equal to at least ten (10) percent of the total bid for:

**Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)**

By my signature on this Bid, I certify, under penalty of perjury under the laws of the State of California, that all the information on this form is true and correct.

By my signature on this Bid, I certify, under penalty of perjury under the laws of the State of California, that the foregoing Statements and Questionnaire are true and correct and that the Bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission regulations (Chapter 5, Title 2 of the California Administrative Code).

By my signature on this Bid, I certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Title 23 United States Code, Section 112 Non-Collusion Affidavit and Title 49 code of Federal Regulations, part 29 Debarment and Suspension Certification, and Disclosure of Lobbying Activities are true and correct.

IN WITNESS WHERE OF Bidder/Contractor executed this Bid as of the date set forth on page **B1** of this Bid.

Signature: _____

Name (printed): _____

Title: _____

“Contractor”

Subcontractor List

Bidder/Contractor submits the following complete list of each Subcontractor who will perform work, labor or render service in or about the construction in an amount in excess of 1/2 of 1% of the total bid or \$10,000 whichever is greater.

Check box on right side of row if any construction item, for the listed Subcontractor, is partial work. If partial work is to be performed within a certain construction item or trade, the Bidder/Contractor shall specify the portion(s) of the work to be performed by the different subcontractors or Bidder/Contractor will be subject to provisions of Public Contract Code Section 4106.

Name of Bidder (Prime/General Contractor): _____

	Subcontractor Name	License Number	Business Address (City, State)	Construction Item(s) [Item Number and Description]	Check if Partial Work
1.					<input type="checkbox"/>
2.					<input type="checkbox"/>
3.					<input type="checkbox"/>
4.					<input type="checkbox"/>
5.					<input type="checkbox"/>
6.					<input type="checkbox"/>
7.					<input type="checkbox"/>

(If applicable, check box.) Additional information for Subcontractor List is attached to this Bid. (A copy of this form may be attached with additional Subcontractor information.)

Percent of work to be performed by Subcontractors: _____%

Note: A minimum of 50% of the work is required to be performed by the prime/general Contractor.

Non-Collusion Declaration

To be executed by bidder and submitted with bid.
(Title 23 United States Code Section 112 and Public Contract Code Section 7106)

The undersigned declares:

I am the _____ (Title) of _____ (Company),
the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder 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. 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.

All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price of any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the applicable laws that the foregoing is true and correct and that this declaration is executed on

_____ (Month) _____ (Day) of _____ (Year),

at _____ (City), _____ (State).

Signature of Declarant: _____

Printed name of Declarant: _____

Name of Bidder (Company): _____

Title or Office: _____

Note: Notarization of signature required.

Check box if attachment is included.

Iran Contracting Act
(Public Contract Code sections 2200-2208)

Prior to bidding on, submitting a proposal or executing a contract or renewal for a County of Riverside contract for goods or services of \$1,000,000 or more, a Contractor must either:

- a) Certify it is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or
- b) Demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code section 2203(c) or (d).

To comply with this requirement, please insert your Contractor or financial institution name and Federal ID Number (if available) and complete one of the options below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of \$250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

Option #1 – Certification

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is **not** on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

<i>Contractor Name/Financial Institution (Printed)</i>		<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>		
<i>Printed Name and Title of Person Signing</i>		
<i>Date Executed</i>	<i>Executed in</i>	

Option #2 – Exemption

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a Contractor/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

<i>Contractor Name/Financial Institution (Printed)</i>		<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>		
<i>Printed Name and Title of Person Signing</i>		
<i>Date Executed</i>	<i>Executed in</i>	

Equal Employment Opportunity Certification

The bidder _____, proposed subcontractor _____, hereby certifies that he has _____, has not _____, participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, 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.

(Company name)

By: _____
(Signature)

(Name, print)

(Title)

(Date)

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 Statements and Questionnaire

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 on a separate page.

Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the 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.

Debarment and Suspension Certification

(Title 49, Code of Federal Regulations, Part 29)

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, 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.

Notes:

Providing false information may result in criminal prosecution or administrative sanctions. Attention is directed to Title 2, Code of Federal Regulations, Parts 180 and 1200. Attention is directed to Form FHWA-1273, Section IV, Subsection 10. Certification of eligibility

The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

Nonlobbying 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 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.
- (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 Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in conformance with its 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 prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such sub-recipients shall certify and disclose accordingly.

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

<p>1. Type of Federal Action:</p> <p><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</p>	<p>2. Status of Federal Action:</p> <p><input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award</p>	<p>3. Report Type:</p> <p><input type="checkbox"/> a. initial <input type="checkbox"/> b. material change</p> <p style="text-align: right;">For Material Change Only: year ____ quarter ____ date of last report _____</p>
<p>4. Name and Address of Reporting Entity</p> <p><input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known</p> <p style="text-align: center;">Congressional District, if known</p>	<p>5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:</p> <p style="text-align: center;">Congressional District, if known</p>	
<p>6. Federal Department/Agency:</p>	<p>7. Federal Program Name/Description:</p> <p style="text-align: right;">CFDA Number, if applicable _____</p>	
<p>8. Federal Action Number, if known:</p>	<p>9. Award Amount, if known:</p>	
<p>10. a. Name and Address of Lobby Entity (If individual, last name, first name, MI)</p>	<p>b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI)</p>	
(attach Continuation Sheet(s) if necessary)		
<p>11. Amount of Payment (check all that apply)</p> <p>\$ _____ <input type="checkbox"/> actual <input type="checkbox"/> planned</p>	<p>13. Type of Payment (check all that apply)</p> <p><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 _____</p>	
<p>12. Form of Payment (check all that apply):</p> <p><input type="checkbox"/> a. cash <input type="checkbox"/> b. in-kind; specify: nature _____ value _____</p>		
<p>14. 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:</p> <p style="text-align: center;">(attach Continuation Sheet(s) if necessary)</p>		
<p>15. Continuation Sheet(s) attached: Yes <input type="checkbox"/> No <input type="checkbox"/></p>		
<p>16. 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.</p>		
<p>Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____</p>		
<p>Federal Use Only:</p>		<p>Authorized for Local Reproduction Standard Form - LLL</p>

Instructions for Completion of Standard Form – 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 and/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. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influenced the covered Federal action.
(b) 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).
11. 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.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. 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.
15. Check whether or not a continuation sheet(s) is attached.
16. The certifying official shall sign and date the form, 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. 06-04-90

Instructions – Local Agency Bidder

DBE Commitment (Construction Contracts), Exhibit 15-G

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 nonresponsive.

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 Contract Item Number and Item of Work and Description or Services to be Subcontracted or Materials to be provided by DBEs. 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 Names of DBE contractors to perform the work (who must be certified on the date bids are opened and include the DBE address and phone number).

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 "List of Subcontractors" submitted with your bid.

There is a column for the DBE participation dollar amount. 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 to be performed or furnished by the DBE.) See Section "Disadvantaged Business Enterprise (DBE)," of the Special Provisions 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.

DBE Information - Good Faith Efforts, Exhibit 15-H

Federal-aid Project No. RSTPLN- 5659(235) Bid Opening Date: _____

The County of Riverside established a Disadvantaged Business Enterprise (DBE) goal of 3.0 % 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 "Local Agency Bidder 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 entitled "Submission of DBE Commitment" of the Special Provisions:

- 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):

<u>Publications</u>	<u>Dates of Advertisement</u>

- 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.):

<u>Names of DBEs Solicited</u>	<u>Date of Initial Solicitation</u>	<u>Follow Up Methods and Dates</u>

- 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.

Bid Bond

Recitals:

1. _____ "Contractor", has submitted his/her Contractor's Proposal to County of Riverside, "County", for the construction of public work for **Interstate 215 at Newport Road, Interchange Improvements, in the City of Menifee, Project No. B5-0682, Federal Aid No. STPLN- 5956(234)** in accordance with a Notice Inviting Bids from the County.
2. _____ a _____ corporation, hereafter called "Surety", is the surety of this bond.

Agreement:

We, Contractor as Principal and Surety as Surety, jointly and severally agree and state as follows:

1. The amount of the obligation of this bond is 10% of the amount of the Contractor's Proposal, including bid alternates, and inures to the benefit of County.
2. This Bond is exonerated by (1) County rejecting said Proposal or, in the alternate, (2) if said Proposal is accepted, Contractor executes the Contract and furnishes the Bonds as agreed to in its Proposal, otherwise it remains in full force and effect for the recovery of loss, damage and expense of County resulting from failure of Contractor to act as agreed to in its Proposal. Some types of possible loss, damage and expense are specified in the Contractor's Proposal.
3. Surety, for value received, stipulates and agrees that its obligations hereunder shall in no way be impaired or affected by any extension of time within which County may accept the Proposal and waives notice of any such extension.
4. This Bond is binding on our heirs, executors, administrators, successors and assigns.

Dated: _____

Signatures:

By: _____

By: _____

Title: Attorney in Fact
"Surety"

Title: _____
"Contractor"

STATE OF _____
COUNTY _____
OF _____

} ss. SURETY'S ACKNOWLEDGEMENT

On _____ before me, _____ personally appeared, _____ known to me, or proved to me on the basis of satisfactory evidence, to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her authorized capacities, and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature of Notary Public

Notary Public (Seal)

Note: This Bond must be executed by both Contractor and Surety with corporate seal affixed. All signatures must be notarized. (Attach acknowledgements).

Contract and Other Bond Documents

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County of Riverside Contract No. _____

Contract

Interstate 215 at Newport Road

Interchange Improvements

in the City of Menifee

Project No. B5-0682

Federal Aid No. STPLN- 5956(234)

THIS CONTRACT, made and concluded, in duplicate as of the date set forth below, between the County of Riverside, party of the first part, and _____ Contractor, party of the second part.

ARTICLE I:

WITNESSETH, that for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the said party of the first part, and under the conditions expressed in the two bonds, bearing even date with these presents, and hereunto annexed, the said party of the second part agrees with the said party of the first part, at his own proper cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the specifications to be furnished by said party of the first part, necessary to construct and complete in a good, workmanlike and substantial manner and to the satisfaction of the County of Riverside, the work described in the Special Provisions and the Project Plans described below, including any addenda No. _____ issued thereto, and also in conformance with the California Department of Transportation Standard Plans, dated 2010 the Standard Specifications, dated 2010 and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished, which said Special Provisions, Project Plans, Standard Plans, Standard Specifications, and Labor Surcharge and Equipment Rental Rates are hereby specially referred to and by such reference made a part hereof.

The work to be done is shown on Plans entitled _____, Sheets 1 through _____, Plan number _____, approved _____, on file with the County Surveyor, which said project plans are hereby made a part of this Contract.

ARTICLE II:

The said party of the first part hereby promises and agrees with the said Contractor to employ, and does hereby employ, the said Contractor to provide the materials and to do the work according to the terms and conditions 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.

ARTICLE III:

The State general prevailing wage rates determined by the Director of Industrial Relations are hereby made a part of this contract. It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the bid or proposal of said Contractor, then this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of said proposal conflicting herewith.

ARTICLE IV:

By my signature hereunder, as Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self insurance in conformance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

ARTICLE V:

And the said Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and for doing all the work contemplated and embraced in this Contract; also for all loss or damage, arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the County of Riverside, and for all risks of every description connected with the work; also for all expenses incurred by or in consequence of the suspension or discontinuance of work and for well and faithfully completing the work, and the whole thereof, in the manner and according to the plans and specifications, and the requirements of the Engineer under them, to wit:

**Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)**

IN WITNESS WHEREOF the parties hereto have executed this Contract as of the date set forth below.

COUNTY OF RIVERSIDE

CONTRACTOR

BY: _____

BY: _____

Chairman, Board of Supervisors

DATED: _____

TITLE: _____

(If Corporation, affix Seal)

ATTEST:

ATTEST:

Kecia Harper-Ihem, Clerk of the Board

BY: _____

TITLE: _____

Deputy

Licensed in accordance with an act providing
for the registration of Contractors,

License No. _____

Federal Employer Identification Number:

BY _____

"County"

"Corporation"

(Seal)

Performance Bond

Recitals:

1. _____ (Contractor) has entered into a Contract with COUNTY OF RIVERSIDE (County) for construction of public work known as _____.
2. _____, a _____ corporation (Surety), is the Surety under this Bond.

Agreement:

We, Contractor as Principal and Surety as Surety, jointly and severally agree, state, and are bound unto County, as obligee, as follows:

1. The amount of the obligation of this Bond is 100% of the estimated contract price for the Project of \$ _____ and inures to the benefit of County.
2. This Bond is exonerated by Contractor doing all things to be kept and performed by it in strict conformance with the Contract Documents for this project, otherwise it remains in full force and effect for the recovery of loss, damage and expense of County resulting from failure of Contractor to so act. All of said Contract Documents are incorporated herein.
3. This obligation is binding on our successors and assigns.
4. For value received, Surety stipulates and agrees that no change, time extension, prepayment to Contractor, alteration or addition to the terms and requirements of the Contract Documents or the work to be performed thereunder shall affect its obligations hereunder and waives notice as to such matters, except the total contract price cannot be increased by more than 10% without approval of Surety.

THIS BOND is executed as of _____.

By _____ By _____

By _____ Type Name _____

Title _____

Its Attorney in Fact
"Surety"

"Contractor"

(Corporate Seal)

(Corporate Seal)

NOTE: This Bond must be executed by both parties with corporate seal affixed. All signatures must be acknowledged. (Attach acknowledgements).

Payment Bond

(Public Works - Civil Code §9550 et seq.)

The makers of this Bond are _____, as Principal and Original Contractor and _____, a corporation, authorized to issue Surety Bonds in California, as Surety, and this Bond is issued in conjunction with that certain public works contract to be executed between Principal and COUNTY OF RIVERSIDE a public entity, as Owner, for \$ _____, the total amount payable. The amount of this bond is one hundred percent (100%) of said sum. Said contract is for public work generally consisting of _____

The beneficiaries of this Bond are as is stated in 9554 of the Civil Code and requirements and conditions of this Bond are as is set forth in 9554, 9558, 9560 and 9564 of said code. Without notice, Surety consents to extension of time for performance, change in requirements, amount of compensation, or prepayment under said contract.

Dated: _____

Original Contractor – Principal

Surety

By _____

By _____

Title _____

Its Attorney In Fact

(If corporation, affix seal)

(Corporate Seal)

(Corporate Seal)

STATE OF _____ }
COUNTY OF _____ }

ss. SURETY'S ACKNOWLEDGEMENT

On _____ before me, _____ personally appeared, _____, known to me, or proved to me on the basis of satisfactory evidence, to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacities, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature of Notary Public

Notary Public (Seal)

NOTE: This Bond must be executed by both parties with corporate seal affixed. All signatures must be acknowledged. (Attach acknowledgements).

General Conditions

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General Conditions

1. Definitions and Terms

Whenever in the Standard Specifications the following terms are used, they shall be understood to mean and refer to the following:

- A. "Department", "Department of Transportation", "State", and "State of California" means the County of Riverside.
- B. "Engineer", and "Director" means the Director of Transportation and Land Management Agency (TLMA) for the County of Riverside, and includes his authorized representatives.
- C. "Laboratory" means the established laboratory of the County of Riverside.
- D. "Plans" means the portion of the Contract Documents consisting of all drawings prepared for the direction and characteristics of the work. A schedule of said drawings which constitutes the plans as of the execution of the Contract is set forth in the Special Provisions and are supplemented by the Standard Plans referred to in the Special Provisions.

Other terms appearing in the Standard Specifications and Contract Documents, including the Special Provisions, shall have the intent and meaning specified in Section 1-1.07, "Definitions" of the Standard Specifications. The following are additional terms appearing in the Contract Documents:

- "County", "Contractor" and "Contract Documents" are identified in the Contract. "County" and "Contractor" includes their authorized representatives are treated throughout as if each were singular in number. "Contractor" includes its surety.
- "Contract Documents" are identified in Instruction to Bidders item 24 "Contract Documents".
- "Business Day" is defined as 7:30 a.m. to 5:30 p.m. Monday through Friday, excepting therefrom when County is closed for holidays as set forth in County Ordinance 358, Section 1, items c. through q.
- "You" and "Your" means the Bidder and/or Contractor.
- "State Highway Agency" (SHA), as referred to in FHWA form 1273, shall mean "County of Riverside". Additionally, some functions of the Federal Government, as described in form 1273, have been delegated to the State of California Department of Transportation.

2. Standard Specifications

The Standard Specifications of the State of California Department of Transportation, edition of 2010 hereafter called "Standard Specifications", including amendments and revisions to the Standard Specifications, are incorporated herein as modified in these General Conditions, the Instructions to Bidders, the Special Provisions and the Plans.

General Conditions govern over all the Contract Documents except the Special Provisions, the Contract, and Bonds.

The following subsections of the Standard Specifications are deleted:

- 2-1.15C(2), DVBE Incentive
- 3-1.08, Small Business Participation Report
- 3-1.11, Payee Data Record
- 8-1.04, Standard Start
- 12-1.03, Flagging Costs

The Standard Specifications of the State of California Department of Transportation, edition as listed in Special Provision Specifications and Plans General Section 1-1.01, hereafter called "Standard Specifications", are incorporated herein as modified in these Special Provisions and the Plans.

Revisions to the Standard Specifications (RSS) for this project, dated 03-21-2014, are incorporated herein. During the advertisement period of this project, this document is available upon request at the office of the County of Riverside Transportation Department and will be available to the awarded Contractor.

Revisions to the Standard Specifications set forth and referenced to in these Special Provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions" of the Standard Specifications. Whenever either the term RSS is used in the Special Provisions, the text or table following the term shall be considered an amendment to the Standard Specifications. In case of conflict between such Revisions and the Standard Specifications, the Revised Standard Specifications shall take precedence over and be used in lieu of the conflicting portions.

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

In the event that discrepancies are encountered which are not addressed herein, the option that provides the method, item or material with the greatest strength, utility, performance shall be selected, as directed by the Engineer.

3. Director of Transportation and Land Management Agency (TLMA)

All work shall be done under the supervision of the Director of TLMA who shall determine the amount, quality, acceptability and fitness of all parts of the work, and interpret the Contract Documents. No act or omission of the Director of TLMA relieves Contractor of the duty to proceed with the work in strict conformity with the Contract Documents.

Upon request, Director of TLMA shall reduce to writing any oral order, objection, requirement or determination. Whenever the Director of TLMA's approval is required, it shall be in writing only.

All communications to the County by Contractor shall be via the Director of TLMA, or such individual(s) as may be designated by the Director of TLMA in his discretion.

No work shall be performed on site other than during normal working hours without the knowledge and consent of the Director of TLMA.

When in Director of TLMA's opinion, weather or other conditions are such that attempts to perform a portion of the work will probably result in work not in accordance with the Contract Documents, he shall so advise the Contractor. When Contractor advises the Director of TLMA that he intends to proceed despite such advice, he does so at his peril. The Director of TLMA may then order Contractor, in writing which specifies the portion of the work involved and the conditions warranting the issuance of the order, not to proceed on such portion of the work if: (1) proceeding will, in his judgment, have an adverse effect on Contractor's ability to complete the work within the stipulated time period, or (2) proceeding will, in his judgment, necessitate unusual tests and procedures to ascertain whether said portion of the work is in accordance with the Contract Documents. Contractor shall comply with such orders at its expense.

Nothing herein contained relieves Contractor from the duty to make independent determinations as to weather and other conditions affecting the proper completion of the work.

Failure for any reason of Director of TLMA to advise Contractor as to such matters, or to issue an order as above provided, does not relieve the Contractor from the duty to accomplish the work in accordance with the Contract Documents.

As stated elsewhere, amounts shown in the Bid and Contract as to quantities are merely estimates only. From time to time Director of TLMA shall direct Contractor as to the prosecution of the work in such a manner as to increase or decrease such estimates as to the work actually to be done. Contractor shall comply with such instructions and shall be paid only for work actually done based on the unit price set out in the Contract.

4. Insurance and Hold Harmless

In lieu of the provisions of Standard Specification Section 3-1.07, "Insurance Policies" and Section 7-1.06, "Insurance, the following shall apply:

A. General:

Contractor shall submit to the County a Certificate of Insurance, signed by an authorized representative of the Contractor's insurance provider or agency, which certifies to the County that insurance coverage is provided in accordance with the requirements of this Section.

Certificate Holder information is as follows:

County of Riverside
Transportation Department
Attn: Contracts/Bidding Unit
3525 14th Street
Riverside, CA 92501

Contractor shall not commence work under the Contract until he has obtained the insurance required hereunder and satisfactory proof of said insurance has been submitted to and accepted by the County.

The County may suspend all Contractor project work activities, at the Contractor's expense, for failure to maintain insurance coverage.

B. Workers Compensation:

The Contractor shall maintain statutory Workers' Compensation Insurance (Part 1) as prescribed by the laws of the State of California. Policy shall include Employers' Liability (Part 2) including Occupational Disease with limits not less than \$1,000,000 per person per accident.

This policy shall be endorsed, and signed, to waive subrogation in favor of the County.

This policy shall also name the "County of Riverside, its Agencies, Special Districts and Departments, their respective director, officers, Board of Supervisors, elected and appointed officials, employees, agents, and representatives" as Additional Insureds.

C. Commercial General Liability:

Commercial General Liability insurance coverage includes but not limited to:

1. Premises, operations and mobile equipment liability

2. Products and completed operations liability
3. Broad form property damage, (including completed operations)
4. Explosion, collapse, and underground hazards
5. Personal and advertising injury
6. Unmodified contractual liability
7. Cross liability coverage
8. Covering claims which may arise from or out of Contractor's performance of its obligations hereunder.

Commercial General Liability insurance coverage amounts are not to be less than the following:

- \$2,000,000 each occurrence
- \$2,000,000 general aggregate
- \$2,000,000 products-completed operations aggregate

Higher limits may be required for projects with higher risk exposure, and higher limits, if required, will be included in the Special Provisions.

Where excess liability insurance is used in connection with primary liability insurance, the combination of such coverage sum must allow total limits of liability to be in amounts not less than the specified amounts.

This policy shall name the "County of Riverside, its Agencies, Special Districts and Departments, their respective director, officers, Board of Supervisors, elected and appointed officials, employees, agents, and representatives" as Additional Insureds.

For additional insured endorsement for excess liability insurance, an acceptable alternative to the policies is a letter, signed by an authorized representative of the insurance carrier, confirming in writing that the policy follows form with respect to the primary liability policy.

D. Automobile Liability:

Contractor shall maintain liability insurance for any auto, all owned, non-owned and hired vehicles so used in an amount not less than \$1,000,000 per occurrence combined single limit. If such insurance contains a general aggregate limit, it shall apply separately to the Contract or be no less than two (2) times the occurrence limit.

Policy shall name the "County of Riverside, its Agencies, Special Districts and Departments, their respective director, officers, Board of Supervisors, elected and appointed officials, employees, agents, and representatives" as Additional Insureds.

E. General Insurance Provisions:

1. **Insurer.** Any insurance carrier providing insurance coverage hereunder shall be admitted to the State of California and have an A M Best rating of not less than A: VIII (A:8) unless such requirements are waived, in writing, by the County Risk Manager. If the County's Risk Manager waives a requirement for a particular insurer such waiver is only valid for that specific insurer and only for one policy term.

Non-admitted/Surplus Line insurance carriers (carriers not licensed in the State of California) may be acceptable to the County under certain conditions. Non-admitted insurance carriers providing any form of insurance coverage must be:

- a. Domiciled or authorized to do business in the United States and/or listed as an approved insurance carrier on the California Department of Insurance's List of Approved Surplus Line Insurers (LASLI) list,
 - b. Have an AM Best rating of not less than A: VIII (A:8), and
 - c. Insurer is authorized to transact in the type of insurance provided.
2. **Self-insured retention (SIR).** The Contractor must declare its insurance self-insured retention for each coverage required herein. If any such self-insured retention exceeds \$500,000 per occurrence, each such retention shall have the prior written consent of the County Risk Manager before the commencement of operations under the Contract. Upon notification of self-insured retention unacceptable to the County, and at the election of the County's Risk Manager, Contractor's carriers shall either:
 - a. Reduce or eliminate such self-insured retention as respects the Contract with the County, or
 - b. Procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses.
 3. **Certificate, policy, endorsements and attachments.** Contractor shall cause Contractor's insurance carrier(s) to furnish the County with:
 - a. A properly executed original Certificate(s) of Insurance and certified original copies of signed endorsements effecting coverage as required herein, and
 - b. All endorsements must include a reference to the policy by type of insurance and policy number that it is endorsing, and
 - c. If requested to do so by the County Risk Manager, provide original certified copies of policies including all endorsements and all attachments thereto, showing such insurance is in full force and effect.

Further, said Certificate(s) and policies of insurance shall contain the covenant of the insurance carrier(s) that thirty (30) days written notice shall be given to the County prior to any material modification, cancellation, expiration or reduction in coverage of such insurance (For nonpayment of premium cause for cancellation, a written notice of at least ten (10) days is allowed per California Insurance Code §662(a)). In the event of a material modification, cancellation, expiration, or reduction in coverage, the Contract shall terminate forthwith, unless the County receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverage's set forth herein and the insurance required herein is in full force and effect.

Contractor shall not commence operations until the County has been furnished original Certificate (s) of Insurance and certified original copies of endorsements and if requested, certified original policies of insurance including all endorsements and any and all other attachments as required in this Section. An individual authorized by the insurance carrier to do so on its behalf shall sign the original endorsements for each policy and the Certificate of Insurance.

4. **Primary insurance.** It is understood and agreed to by the parties hereto that the Contractor's insurance shall be construed as primary insurance, and the County's insurance and/or deductibles and/or self-insured retention's or self-insured programs shall not be construed as contributory.
5. **Subcontractor(s).** Contractor shall pass down the insurance obligations contained herein to all tiers of subcontractors working under the Contract.
6. **Self-insurance.** The insurance requirements contained in the Contract may be met with a program(s) of self-insurance acceptable to the County.
7. **Claim notification.** Contractor agrees to notify County of any claim by a third party or any incident or event that may give rise to a claim arising from the performance of the Contract.
8. **Certificate Holder.** Certificate address information for this project is as follows:

County of Riverside
Transportation Department
Attn: Contracts/Bidding Unit
3525 14th Street
Riverside, CA 92501

F. Hold Harmless/Indemnification:

Contractor shall indemnify and hold harmless the County of Riverside, its Agencies, Districts, Special Districts and Departments, their respective directors, officers, Board of

Supervisors, elected and appointed officials, employees, agents and representatives (individually and collectively hereinafter referred to as Indemnitees) from any liability whatsoever, based or asserted upon any services of Contractor, its officers, employees, subcontractors, agents or representatives arising out of or in any way relating to the Contract, including but not limited to property damage, bodily injury, or death or any other element of any kind or nature whatsoever arising from the performance of Contractor, its officers, employees, subcontractors, agents or representatives Indemnitors from the Contract. Contractor shall defend, at its sole expense, all costs and fees including, but not limited, to attorney fees, cost of investigation, defense and settlements or awards, the Indemnitees in any claim or action based upon such alleged acts or omissions.

With respect to any action or claim subject to indemnification herein by Contractor, Contractor shall, at their sole cost, have the right to use counsel of their own choice and shall have the right to adjust, settle, or compromise any such action or claim without the prior consent of County; provided, however, that any such adjustment, settlement or compromise in no manner whatsoever limits or circumscribes Contractor's indemnification to Indemnitees as set forth herein.

Contractor's obligation hereunder shall be satisfied when Contractor has provided to County the appropriate form of dismissal relieving County from any liability for the action or claim involved.

The specified insurance limits required in the Contract shall in no way limit or circumscribe Contractor's obligations to indemnify and hold harmless the Indemnitees herein from third party claims.

In the event there is conflict between this clause and California Civil Code §2782, this clause shall be interpreted to comply with Civil Code 2782. Such interpretation shall not relieve the Contractor from indemnifying the Indemnitees to the fullest extent allowed by law.

5. Beginning of Work, Time of Completion, and Liquidated Damages

Attention is directed to Instruction to Bidders Section 20, "Hours of Work."

Attention is directed to the Standard Specifications Section 8, "Prosecution and Progress".

Attention is directed to the Special Provision Section 00-1.03, "Time of Completion".

Attention is directed to the Special Provision Section 00-1.05 "Liquidated Damages".

6. County's Right to Stop Work or Terminate the Contract

(1) Contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors, or (2) a receiver or liquidator is appointed for Contractor or any of his property, or (3) Contractor shall refuse or fail after Notice of Warning from County by Director of TLMA to supply sufficient properly skilled workmen or suitable materials, or (4) Contractor fails to prosecute the work with such diligence as will insure its completion within the stipulated time period, or (5) Contractor shall fail to make payments to persons supplying labor or materials for the work, or (6) Contractor does not comply with applicable law or instructions of Director of TLMA, or (7) Contractor is otherwise guilty of a substantial violation of any provision of the Contract Documents, then County without prejudice to such other and further right, remedy or relief it may be entitled to, may by ten (10) days notice to Contractor, terminate the employment of Contractor and his right to proceed, either as to the entire work, or at County's option, as to any portion thereof as to which delay shall have occurred or breach or noncompliance relates, and may thereupon take possession of the affected work and complete the work by contract or otherwise, as County deems expedient. In such case, Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance shall exceed the expense of completion, and other damage, expense or loss of County occasioned by Contractor's failure to properly perform, such excess shall be paid by Contractor. If such expense and damage exceeds the unpaid balance, Contractor is liable to County for the excess. If County elects to proceed under this Section, it may take possession of and utilize in completing the work such materials, supplies, plant and equipment on site which may be necessary or convenient for the purpose of completing the work, County is expressly granted the right - acting via Director of TLMA, an Engineer or otherwise - to operate equipment and machinery on site for the purpose of determining whether it has a basis for proceeding under this Section.

If the construction of the project herein is damaged, which damage is determined to have been proximately caused by an act of God, in excess of 5% of the contract amount (Public Contract Code §7105(a)), provided that the work damaged is built in accordance with applicable building standards and the plans and specifications, then the Owner, upon certification by the Engineer, may, without prejudice to any other right of remedy, terminate the contract.

Decision by County not to proceed under this Section does not constitute a waiver by County of any right it might from time to time have against Contractor under the Contract Documents.

7. General Prevailing Wage:

Attention is directed to General Conditions Section 9, "Labor Code".

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

Pursuant to §1773 of the Labor Code, the general prevailing wage rates, including the per diem wages applicable to the work, and for holiday and overtime work, including employer payments for health and welfare, pension, vacation, and similar purposes, in the county in which the work is to be done have been determined by the Director of the California Department of Industrial Relations (DIR). These wages are set forth in the General Prevailing Wage Rates for this project and are available from the DIR's web site at: <http://www.dir.ca.gov>

General prevailing wage determinations are on file at Transportation Department Washington Street Yard's Contraction/Inspection office and are available to any interested party upon written request.

General prevailing wage determinations are also made by the DIR Pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1773, and 1773.1 may also be obtained at the following URL:

www.dir.ca.gov/DLSR/PWD/index.htm

The Contractor must post a copy of the determination of the DIR prevailing rate of per diem wages at each job site.

8. Federal Prevailing Wage Decision

The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes, referred to as the "Bid" and in copies of this book (See Appendix D) that may be examined at the office location described above where project Plans, Special Provisions, and bid forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of Bid books.

Attention is directed to the Federal minimum wage rate requirements in the Bid Book. 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, the Contractor and subcontractors shall pay not less than the higher wage rate. The County 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 the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

See Appendix D for Federal Prevailing Wage Decision rates.

9. Labor Code

Reference is made to Chapter 1, Part 7, Division 2 of the California Labor Code (commencing with §1720). By this reference said Chapter 1 is incorporated herein with like effect as if it were here set forth in full. The parties recognize that said Chapter 1 deals, among other things with discrimination, penalties and forfeitures, their disposition and enforcement, wages, working hours, and securing worker's compensation insurance and directly affect the method of prosecution of the work by Contractor and subject it under certain conditions to penalties and forfeitures. Execution of the Contract by the parties constitutes their agreement to abide by said Chapter 1, their stipulation as to all matters which they are required to stipulate as to by the provisions of said Chapter 1, constitutes Contractor's certification that he is aware of the provisions of said Chapter 1 and will comply with them and further constitutes Contractor's certification as follows: "I am aware of the provisions of §3700 of the California Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract." Contractor and his subcontractors shall comply with the provisions of SS 1777.5 of the Labor Code regarding apprentices.

Contractor shall post at each job site during the course of the work a copy of County's "Determination of Prevailing Wage Rates", copies of said Determination are available at Transportation Department Washington Street Yard's Contraction/Inspection office for this purpose.

10. Labor Nondiscrimination

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

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

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

11. Equal Employment Opportunity

A. General

Contractor shall not discriminate in its recruiting, hiring, promotion, demotion or termination practices on the basis of race, religious creed, color, national origin, ancestry, sex, age or physical handicap in the performance of this Contract shall comply with the provisions of the California Fair Employment Practice Act (commencing with SS 1410 of the Labor Code), the Federal Civil Rights Act of 1964 (P.L. 88-352) and all amendments thereto, Executive Order No. 11246 (30 Federal Register 12319), as amended, and all administrative rules and regulations issued pursuant to said Acts and Order. See particularly 41 Code of Federal Regulation (CFR) Chapter 60.

Contractor shall require each of its subcontractors to comply with the preceding paragraph and shall include in each subcontract language similar to the preceding paragraph.

Contractor shall permit access to its records of employment, employment advertisement, application forms and other pertinent data and records by Owner and any State or Federal agency having jurisdiction for the purpose of investigation to ascertain compliance with this Section.

Owner may assign an affirmative action representative to monitor Contractor and its subcontractor(s) conduct required by this Section, including the right of entry to the construction site for the purpose of obtaining information from persons performing work on the project providing such inspection does not interfere with the progress of the work.

Elsewhere in the Contract Documents specific requirements may be contained covering the same subject matter of this Section. If so, such specific requirements prevail over this Section in case of conflict.

B. Transactions of \$10,000 or Under

Contracts and subcontracts not exceeding \$10,000 are exempt from the requirements of this Section. No Contractor or subcontractor shall procure supplies and/or services in less than usual quantities to avoid applicability of this Section. With respect to contracts and subcontracts for indefinite quantities, this Section applies unless the amount required in any one year under such contract will reasonably be expected not to exceed \$10,000.

C. Transactions in Excess of \$10,000, but Less Than \$50,000

At Owner's request, Contractor shall certify that it has in effect an affirmative action plan and agrees to comply with all State and Federal laws and regulations regarding Fair Employment Practices. Contractor shall maintain a written copy of its affirmative action plan and furnish Owner a copy of the plan upon request. Owner may require Contractor

to complete an Affirmative Action Compliance Report, on a form furnished by Owner, setting forth definite goals during the term of the Contract.

D. Transactions of \$50,000 or More

If Contractor has fifty or more employees and a Contract for \$50,000 or more, it shall develop and submit to Owner, within thirty days after award, a written affirmative action compliance program providing in detail specific steps to guarantee equal employment opportunity. Contractor shall include in its affirmative action program a table of job classifications, which table shall include but need not be limited to job titles, duties, and rates of pay.

Contractor shall in each subcontract let to do a portion of the work covered hereunder, where the subcontractor involved has fifty or more employees and the subcontract is for \$50,000 or more, impose in the subcontract the above requirements.

For the purpose of determining the number of employees, the average of the Contractor's or its subcontractor's employees for the twelve month period immediately prior to award, or the total number of employees the Contractor or its subcontractor will have when performing this contract, whichever is higher, shall be used.

E. Federal Assisted Construction

If this project is a Federally assisted construction project, then the contract provisions contained in 41 CFR SS 60-1.04 (b) are incorporated herein and the Contractor shall likewise incorporate said provisions in each subcontract entered by Contractor to perform the work. Federally assisted construction is identified as such in the Notice To Bidders .

12. Subcontracting

Attention is directed to:

- Standard Specification Section 2-1.33C, "Subcontractor List",
- Standard Specification Section 5-1.13, "Subcontracting", and
- Instruction to Bidders Section 11, "Subletting, Subcontracting, and Subcontractor List".

Contractor responsibility

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

Violations and remedies

If the Contractor violates Public Contract Code § 4100 et seq., the County may exercise the remedies provided under Public Contract Code § 4110. The County may refer the violation to the Contractors State License Board as provided under Public Contract Code § 4111.

50% Minimum work performance

The Contractor shall perform work equaling at least 50 percent of the value of the original total bid with the Contractor's own employees and equipment, owned or rented, with or without operators. The fifth paragraph is deleted for Subcontracting Standard Provision subsection 5-1.13A, "General".

Subcontractor compliance

Each subcontractor must comply with the contract.

Active license

Each subcontractor must have an active and valid State contractor's license with a classification appropriate for the work to be performed (Business & Professional Code, § 7000 et seq.).

Submittal of subcontracts

Contractor must submit copies of subcontracts upon request by the Engineer.

Submittal of subcontractor request form

Before subcontracted work starts, Contractor must submit a Subcontracting Request form (Caltrans LAPM, Exhibit 16-B, See Appendix).

Debarred contractors

The County will not award a contract to a debarred Contractor. Contractor must not use a debarred subcontractor. Pursuant to the provisions in §1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a current list of contractors ineligible to perform work on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web address at:

<http://www.dir.ca.gov/dlse/debar.html>

Termination of unsatisfactory subcontractors

Upon request by the Engineer, Contractor must immediately remove and not again use a subcontractor who fails to prosecute the work satisfactorily (Public Contract Code §4107(a)(7)).

Substitutions

Subcontractor substitutions will be processed as required by Public Contract Code § 4107 et seq.

Federal requirement constraint

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Appendix E of these Special Provisions. Noncompliance shall be corrected. **Payment for subcontracted work involved will be withheld** from progress payments due, or to

become due, until correction is made. Failure to comply may result in termination of the contract. (Refer to 29 CFR5.5 and also to Form FHWA-1273 section I.3, May 1, 2012 version).

13. Monthly Progress Estimates and Payments

Attention is directed to Section 9-1.16, "Progress Payments" and 9-1.17, "Payment After Contract Acceptance" of the Standard Specifications and these Special Provisions.

For the purpose of timely payment, the "receipt of payment request" date, as described in Public Contract Code 20104.50 and as referred to herein, shall be considered to be the fifth working day following the 25th day of each month.

Within five (5) working days of the 25th day of each month the County shall:

- A. Calculate and prepare the certificate ("progress pay estimate") stating the value of the work completed for the billing month, for the purpose of determining the proper progress payment amount.
- B. If a progress pay estimate has been prepared by the County but has been contested by the Contractor as of the "receipt of payment request" date, as defined above, the County shall submit to the Contractor a document setting forth in writing a description of the dispute pertaining to the progress billing, and the County's reason for its position. Said document shall be submitted to the Contractor as soon as practicable, but not later than seven (7) calendar days after the "receipt of payment request" date.

Any progress pay estimate which is undisputed and remains unpaid for thirty (30) calendar days, after the "receipt of payment request date" shall accrue interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of §685.010 of the California Code of Civil Procedure. The number of days available to the County to make a payment without incurring interest pursuant to this Section shall be reduced by the number of days by which the County exceeds the seven-day submittal requirement set forth in the paragraph above.

Pursuant to Public Contract Code §20104.50, subsection (e), the progress payment date is the date that funds are encumbered and the payment warrant is issued.

The partial payments made as the work progresses will be payment on account on work performed as of the 25th of the month and shall in no way be considered as an acceptance of any part of the work or material of the contract, nor shall they in any way govern the final estimate.

No estimate or payment shall be made when, in the judgment of the Director of TLMA, the total value of the work done since the previous estimate amounts to less than \$300.

14. Deposit of Securities

In accordance with Public Contract Code §22300 and other applicable law, the Contractor may substitute securities for any moneys withheld to ensure performance under the contract.

15. Prompt Progress Payment to Subcontractors

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

Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 day of receipt of each payment may take place only for good cause and with the County's prior written approval.

This provision applies to DBE and non-DBE prime Contractors and subcontractors.

16. Prompt Payment of Withheld Funds to Subcontractors

No retainage will be withheld by the County from progress payments due the prime Contractor. Retainage by the prime Contractor or subcontractors is prohibited and no retainage will be held by the prime Contractor from progress due subcontractors. Any violation of this provision shall subject the violating prime Contractor or subcontractor to the penalties, sanctions and other remedies specified in §7108.5 of the California Business and Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the prime Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime Contractor or deficient subcontract performance, or noncompliance by a subcontractor.

This provision applies to DBE and non-DBE prime Contractors and subcontractors.

17. Payment for Extra Work (Force Account Basis)

Extra work to be paid for on a force account basis as directed by the Engineer will be paid for as set forth in Section 9-1.04 "Force Account" of the Standard Specifications. The labor surcharge, equipment rental rates, and the right of way delay factors for each classification of equipment are listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates". A copy of which is on file at the Office of the Director of TLMA and is hereby incorporated herein in its entirety.

18. Change Orders – Detail Drawings and Instructions

Reference is made to 4-1.05, "Changes and Extra Work" of the Standard Specifications regarding change orders.

Each approved change order shall be considered as an amendment to the Contract Documents and will not be considered approved until executed by the Board of Supervisors, except when Director of TLMA can approve certain change orders, without the necessity of approval by the Board, as provided in a Resolution of the Board adopted January 11, 2011, Resolution 2011-015.

The above does not limit the ability of Director of TLMA to issue further detail drawings, explanations, and instructions which are customarily given by an Engineer during the course of similar work. Director of TLMA will furnish Contractor, in reasonable promptness, with further detailed explanations, instructions and drawings as may be necessary for the proper execution of the work, and Contractor shall conform to same provided they are consistent with the intent of the Contract Documents. In giving such additional instructions, explanations and drawings Director of TLMA has authority to make minor changes in the work which do not involve extra cost and are not inconsistent with the Contract Documents.

Contractor's acting on such instructions, explanations and drawings of Director of TLMA means that Contractor agrees that such explanations, instructions and drawings are within the scope of the work in accordance with the intent of the Contract Documents and do not constitute a basis for modification of the Contract Documents as to price or time.

19. Final Payment

Within thirty (30) days after the completion of the work and its acceptance by the Board of Supervisors, Director of TLMA will make a proposed final estimate in writing of the quantities of work done under the contract and the value of such work and will submit such estimate to Contractor. Within thirty (30) days thereafter Contractor shall submit to Director of TLMA his written approval of said proposed final estimate or a written statement of all claims which he has for additional compensation claimed to be due under the contract.

On Contractor's approval or if he files no claims within said period of thirty (30) days, Director of TLMA will issue a final written estimate as submitted to Contractor and County

shall pay the entire sum so found to be due after deducting there from all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the contract.

If Contractor files claim(s) within said period of thirty (30) days, Director of TLMA will issue as a semi-final estimate the proposed estimate submitted to Contractor and the County will within thirty (30) days pay the sum found due thereon after deducting all prior payments and all amounts to be kept and retained under the provisions of the contract, Director of TLMA shall then consider and investigate Contractor's claims and shall make such revisions in the said estimate as he may find to be due, and shall then make and issue his final written estimate. County will pay the amount so found due after deducting all previous payments and amount to be retained under the contract.

All prior or partial estimates and payments shall be subjected to correction in the final estimate and payment.

The final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the performance of the contract and the amount of work done there under and compensation therefore, except in the case of gross error. Acceptance of final payment constitutes a release of County by Contractor of all claims relating to the work.

20. Assignment of Claims

In submitting a bid on this public works project, or any subcontractor agreeing to supply goods, services, or materials, and entering a contract pursuant thereto, the Contractor and/or subcontractor do offer and agree to assign to the Owner 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. Section 15) or under the Cartwright Act (Chapter 2 (commencing with §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 the Contractor, without further acknowledgement by the parties.

21. Arbitrations

Section 9-1.22, "Arbitration" of the Standard Specifications is deleted.

22. Claims Resolution

In accordance with Public Contract Code §20104 through §20104.8 and other applicable law, public works claims of \$375,000 or less, which arise between the Contractor and the Owner shall be resolved following the statutory procedure, unless the Owner has elected to resolve the dispute pursuant to Public Contract Code SS 10240 et seq.

- A. All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the claimant for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by the Owner.

1. Claims Under or equal to \$50,000

The Owner shall respond in writing to the claim within 45 days of receipt of the claim, or, the Owner may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses of claims the Owner may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of the Owner and the claimant. The Owner's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.

2. Claims over \$50,000 but less than or equal to \$375,000

The Owner shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses of claims the Owner may have against the claimant. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between the Owner and the claimant. The Owner's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce the additional information or documents, whichever is greater.

- B. If the claimant disputes the Owner's response, or if the Owner fails to respond within the statutory time period, the claimant may so notify the Owner within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, the Owner shall schedule a meeting and confer conference within 30 days.
- C. If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code SS 900 et seq. and Government Code SS 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.
- D. If a civil action is filed to resolve any claim, the provisions of Public Contract Code SS 20104.4 shall be followed, providing for non-binding mediation and judicial arbitration.

23. Brand or Trade Name – Substitute of Equals

Attention is directed to Section 6-3.02, "Specific Brand or Trade Name and Substitution."

Reference is made to §3400 of the Public Contracts Code, which is by this reference incorporated herein with like effect as if here set forth in full.

If a potential Bidder believes he knows of an equal to a specified brand or trade name which is not mentioned in the Contract Documents, then such potential bidder may so advise Director of TLMA of such fact, giving all relevant information. If appropriate, an addendum will be issued as to the alleged equal provided that such issuance may be accomplished at least 5 business days before the time fixed for opening bids.

Unless the subject article or product is expressly designated for matching others in use in a particular public improvement either completed or in the course of completion, any bidder may, as part of its bid proposal, include a request for substitution of an item equal to any specified by brand or trade name.

Within 30 calendar days after award of the contract, Contractor may submit to Director of TLMA data substantiating such a request, and the difference, if any, in cost. Director of TLMA shall promptly investigate the request and make a recommendation to County as to equality. The governing body of County shall promptly determine whether the substitute is equal in every respect to the item specified, and approve or deny the request accordingly, and shall notify Director of TLMA of the determination made, who shall advise Contractor in writing of the decision. Unless the request is granted, substitution will not be permitted.

Nothing herein shall authorize a change in the contract price or prevent the use of change orders in the manner provided elsewhere in the Contract Documents.

24. Site Inspection – Effect of Other Improvements Shown and Contractor Procedure

Elsewhere in the Contract Documents reference may be made graphically, descriptively, or both, to the existence or possible existence of other improvements affecting the site and the prosecution of the work such as surface and subsurface utilities, drainage ditches and courses, buildings, fencing, retaining walls, roadways, curbs, trees, shrubs, and similar matters. Such matters are included to be used by Contractor to the extent he deems appropriate. However, it is expressly understood and agreed:

- A. Showing or describing such items does not mean that it is an exhaustive and complete presentation and that as to matters shown or described that they necessarily exist.
- B. All graphic presentations are schematic only unless the contrary is clearly set out elsewhere as to a particular matter.

- C. Whenever in the plans survey markers are shown, boundaries of the site are shown or contour lines are shown, Contractor may assume that such matters are shown in accordance with acceptable standards.

All improvements of the nature described above, whether elsewhere shown or described or not, shall, unless the contrary is elsewhere specifically directed, remain in place, undisturbed and suitably protected during the course of the work.

Whenever, during the course of the work, a subsurface improvement is discovered, which Contractor believes is unknown to County, he shall immediately inform Director of TLMA. Except as elsewhere provided, whenever in the course of the work it becomes apparent that the work cannot proceed without the destruction or relocation of any improvement, whether shown or described or not, Contractor shall immediately cease work affecting such improvements, notify Director of TLMA as to such circumstance, and await instructions as to how to proceed.

- D. The Contractor shall be required to cooperate fully with all utility forces or forces of other public agencies engaged in relocation, lowering, altering or otherwise rearranging any facilities interfering with the progress of work or installing any facilities thereon.

The Contractor will also be required to cooperate fully with any County or State forces working on or near the project, or requiring access to the work in the performance of their duties.

25. Public Safety

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

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

A. **Excavations**

The near edge of the excavation is 12 feet or less from the edge of the lane, except:

1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
2. Excavations less than 1 foot deep.
3. Trenches less than 1 foot wide for irrigation pipe or electrical conduit, or excavations less than 1 foot in diameter.
4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical: horizontal).

6. Excavations protected by existing barrier or railing.

B. Temporarily Unprotected Permanent Obstacles

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

C. Storage Areas

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

The approach end of Type K temporary railing installed in conformance with the provisions in this Special Provision section "Public Safety" and in Section 7-1.04, "Public Safety" of the Standard Specifications, shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 1 foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15 feet minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Type K Temporary railing shall conform to the provisions in Section 12-3.08, "Type K Temporary Railing" of the Standard Specifications. Type K Temporary Railing, conforming to the details shown on 2010 Standard Plans T3A and T3B, may be used. Type K Temporary Railing fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

(Verify verbiage with C/I regarding fabrication dates... Is this still an issue?)

Temporary crash cushion modules shall conform to the provisions in 12-3.15 "Temporary Crash Cushion Module" of Standard Specifications, if applicable.

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

Approach Speed of Public Traffic Posted Limit	Work Areas
Over 45 Miles Per Hour	Within 6 feet of a traffic lane but not on a traffic lane

35 to 45 Miles Per Hour	Within 3 feet of a traffic lane but not on a traffic lane
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The lane closure provisions of this Section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

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

Payment

Full compensation for conforming to the provisions in this Section, Public Safety, including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

26. Extra Work

Section 4-1.05, "Changes and Extra Work" of the Standard Specifications is amended by adding the following:

If, in the opinion of the Engineer, such work cannot reasonably be performed concurrently with other items of work, and if a controlling item of work is delayed thereby, an adjustment of contract time of completion will be made.

27. Noise Control

Noise control shall conform to the provisions in Section 14-8.02, "Noise Control" of the Standard Specifications and these Special Provisions.

Section 14-8.02A, "General", second paragraph, is deleted and replaced with the following:
The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dBA LMax at a distance of 50 feet. This requirement in no way

relieves the Contractor from responsibility for complying with local ordinances regulating noise level.

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

Payment

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

28. Use, Care and Protection of Premises

Attention is directed to Section 5-1.36, "Property and Facility Preservations" of the Standard Specifications.

At his expense Contractor shall:

- A. Take every precaution against injuries to persons or damage to property.
- B. Comply with regulations governing the use of the property.
- C. Store and suitably protect his apparatus, equipment, materials and supplies in an orderly fashion on site.
- D. Place on the work only such loads as are consistent with the safety of the work.
- E. Effect all cutting, fitting, or patching of his work required to make it conform to the Plans and Specifications and interrelate with other improvements or except with the consent of Director of TLMA, cut or otherwise alter existing improvements.
- F. Protect and preserve established bench marks and monuments, make no changes in the location of such without the prior written approval of County, replace and relocate any of them which may be lost or destroyed, or which require shifting because of necessary changes in grades or locations. All replacement and relocation work shall be accomplished only after approval of County and under the direct supervision and instruction of Director of TLMA.
- G. Before final payment remove all surplus materials, false work, temporary structures, debris, and similar matter resulting from his operations from the site and to put the site in an orderly condition.

- H. Construct, operate and maintain all passageways, guard fences, lights, barricades and other facilities required for protection by State or municipal laws and regulations and local conditions during the course of the work.
- I. Guard County's property from injury or loss.
- J. Take all reasonable precautions for dust and noise control and generally conduct operations so as not to constitute a nuisance.
- K. The Contractor shall be responsible for the protection of existing signs, fences, concrete curb and gutter and other highway facilities which may be encountered in the roadway. The replacement or repair of any facilities which the County deems necessary as a result of the Contractor's operations shall be done by the Contractor at his own expense and to the satisfaction of the County Transportation Department.

Payment

Full compensation for conforming to the requirements of this Section, Use, Care and Protection of Premises, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

29. Obstructions

Attention is directed to Section 5-1.36D, "Nonhighway Facilities", Section 15, "Existing Facilities" and 51-1.03E(9), "Utility Facilities", of the Standard Specifications and these Special Provisions.

In the event that the utility facilities mentioned within the referenced Standard Specifications and/or Special Provisions are not removed or relocated by the times specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by said times, the County will compensate the Contractor for such delays to the extent provided in Section 8-1.07, "Delays" of the Standard Specifications, except as provided in the previous paragraph referenced sections of the Standard Specifications.

30. Removal of Asbestos and Hazardous Substances

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

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

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

31. Documents of Contractor

Upon demand, Contractor shall make available to County all documents in its possession relevant to the work accomplished or to be accomplished or any demand or claim of Contractor as to County. This includes copies of documents sent by Contractor or others in its possession. Contractor shall further make available to County conformed copies of all documents submitted to the sureties who executed the Bid Bond, Performance Bond, or Payment Bond for the purpose of obtaining the sureties' signature, including any guarantee or indemnification made to such surety by others for such purpose. Contractor shall maintain in his possession all documents relative to the work for three years after Notice of Completion.

32. Responsibility of Contractor to Act in an Emergency

In case of an emergency which threatens loss or injury to property or life, Contractor shall act without previous instructions as the situation may warrant. Contractor shall notify Director of TLMA immediately thereafter. Any compensation claimed by Contractor, together with substantiating documentation shall be submitted to County via Director of TLMA.

33. Final Inspection – Notice of Completion

When the work is ready for final inspection, County shall cause the work to be inspected and subjected to such tests as seem to it to be required for the purpose of determining if the work is complete in every respect.

At a meeting of the governing body of County held within ten (10) days after final inspection, the governing body shall consider the facts developed at the inspection. If it is found that the work is apparently complete in every respect, County will accept the work and a Notice of Completion will be recorded.

As between the parties, the recordation of the Notice of Completion, unless recorded because of a cessation of labor, means only that the time for final payment and the commencement of the guarantee period commences to run.

34. Dust Abatement

Dust control shall conform to Section 14-9.03, "Dust Control", Section 14-9.02, "Air Pollution Control", Section 17, "Watering", and Section 18, "Dust Palliative" of the Standard Specifications, Rules no. 401, 402, 403 and 403.1 of the South Coast Air Quality Management District (AQMD), Riverside County Code, Chapter 8.52, "Fugitive Dust Reduction Program For Coachella Valley" (if project location is within the Coachella Valley), all other applicable Federal and State laws, and the requirements set forth herein.

The Contractor is cautioned that failure to control fugitive dust may result in fines being levied by the South Coast Air Quality Management District to both the Contractor and the County, as Owner. The Contractor shall be fully responsible for payment of all fines pertaining to air pollution control violations, resulting from Contractor's operations related to the construction contract, which may be levied against both the Contractor and the County by the AQMD or other regulatory agencies. The Contractor's attention is directed to Section 7-1.02, "Laws" and Section 7-1.02A "General" of the Standard Specifications. The cost of all fines levied against the County will be deducted from any moneys due or which may become due to the Contractor, unless other payment arrangements are made by the Contractor.

Dust control of all of the Contractor's operations is required 24 hours per day, 7 days a week for the duration of the contract, and until the disturbed soil is permanently stabilized. The Contractor shall take every precaution to prevent emissions of fugitive dust from the project site, from locations of stockpiled materials, from unpaved driving surfaces, from haul vehicles, from inactive construction areas, and from all other operations of the Contractor. The Contractor shall plan for and carry out proper and efficient measures to prevent their operations from producing dust in amounts damaging to property or which constitute a public nuisance, or which cause harm to persons living or working in the vicinity of the work. Particular concern of emissions is PM10 particles. PM10 particles are fine particulate matter of 10 microns or less which are associated with sickness and death from respiratory disease.

The Contractor shall furnish and post dust mitigation signs, which shall be, at a minimum, in accordance with the "AQMD Recommendations", attached hereto (See Appendix). Additional copies are available upon request from the Engineer. The sign shall include the Contractor's phone number which shall be maintained on a 24 hour basis. The sign message, size and design, including any deviations from the signage recommendations, shall be approved by the Engineer prior to fabrication.

The Contractor shall respond to complaints by mobilizing equipment and personnel at the construction site within 2 hours of each complaint to control fugitive dust.

Attention is directed to AQMD Rule 403.1, which applies to all contracts within the Coachella Valley Area of Riverside County. That AQMD Rule requires the Contractor to take specified dust control actions when prevailing wind speeds exceed 25 miles per hour. Wind forecasts, AQMD Rules and other related information are provided by AQMD at 1-800-CUT-SMOG and at www.aqmd.gov.

Any days on which the Contractor is prevented from working, due to the requirements of AQMD Rules, will be considered as non-working days, in accordance with Section 8-1.05, "Time" of the Standard Specifications.

The Contractor shall utilize the "Best Available Control Measures" of controlling fugitive dust, as prepared by the AQMD. For projects within the Coachella Valley, the "Reasonably Available Control Measures" may be employed, if effective within the context of the AQMD rules. However, if fugitive dust crosses the project boundary, more effective control measures, including the "Best Available Control Measures" shall be implemented.

A site-specific fugitive dust control plan shall be submitted to the Engineer for review and approval at least 10 days prior to the start of construction. Additionally, for projects outside of the Coachella Valley which meet the criteria for AQMD plan approval, the Contractor shall submit the dust control plan to AQMD for approval. AQMD plan submittal criteria is defined in AQMD Rule 403 as being for projects that will have disturbed surface area in excess of 100 acres, or for projects with a scope of work which requires the movement of more than 10,000 cubic yards of soil on each of any three working days.

A sample plan and other pertinent information is attached, and additional copies are available from the Engineer upon request. The fugitive dust control plan shall include the "Reasonably Available Control Measures" and "Best Available Control Measures" of controlling fugitive dust, as may be appropriate and necessary, including but not limited to watering, application of chemical dust suppressants, wind fencing, covering of haul vehicles, haul vehicle bed-liners, covering or chemically stabilizing stored materials, phased grading, planting of vegetation, the use of a 24 hour environmental observer, and track-out controls at locations where unpaved construction accesses intersect with paved roads. The use of chemical stabilizers, which are approved by all environmental regulatory agencies, and the use of reclaimed water is encouraged. If water is intended as a primary dust control tool, the dust control plan shall provide for at least one 2,000 gallon water truck for every 4 acres of disturbed soil, unless otherwise approved by the Engineer.

If the Construction Engineer determines that the project scope and the forecasted weather conditions are such that the Contractor's work is unlikely to be a source of dust emissions, the Construction Engineer has the authority to waive the requirements for submittal of a dust control plan and for placement of the dust control signs described herein. However, the Contractor's responsibilities for the control of fugitive dust and the other requirements of this Section may not be waived.

A completion notice will not be filed, and the final payment will not be made to the Contractor until the areas of disturbed soil on the construction site, including roadway shoulders, are suitably stabilized for long term control of fugitive dust.

The successful Contractor shall attend an AQMD PM10 Dust Control Program training session, and furnish evidence of attendance to the Engineer. Attendance at AQMD training seminars can be scheduled through AQMD at 1-866-861-DUST (1-866-861-

3878) or by email to dustcontrol@aqmd.gov. Current AQMD certification of previous attendance will be accepted.

At that training session, the successful Contractor will be furnished with the AQMD prepared Rule 403 and Rule 403.1 implementation handbooks, which include the "Best Available Control Measures" and "Reasonably Available Control Measures", and other associated information, including a listing of suggested dust control related devices, materials and chemicals.

The signature of the Contractor on the Bid constitutes acknowledgement by the Contractor of the dust control requirements established by law and described herein, and the enforceability of those requirements.

Payment

When the contract includes a bid item for Dust Abatement or Dust Control, full compensation for conformance with these dust abatement requirements, including labor, equipment, materials, developing water supply and incidentals, shall be paid at the lump sum price for Dust Abatement or Dust Control, and no additional compensation will be allowed therefor.

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DIVISION 0 COUNTY PROVISIONS

00 COUNTY MISCELLANEOUS

00-1.01 PROJECT DESCRIPTION:

Attention is directed to Section 4 "SCOPE OF WORK" of the Standard Specifications.

In general this project proposes to reconstruct and widen the existing interchange located on Interstate 215 at Newport Road. The project is located in the City of Menifee.

The proposed improvements will include the following:

- A. Reconstruct the existing diamond interchange into a partial cloverleaf interchange configuration, with northbound and southbound loop on-ramps.
- B. Widening the existing bridge to accommodate six through lanes of traffic, deceleration lanes approaching the loop on-ramps, outside shoulders that will be used as bike lanes and a sidewalk on the north side of the bridge.
- C. Add acceleration lanes to the direct on-ramps and deceleration lane to the northbound off-ramp.
- D. Widening the northbound bridge over Salt Creek to accommodate the northbound on-ramp acceleration lane.
- E. Traffic Signals.

Note: The aerial topographic mapping included on the project plans reflects two existing mainline lanes in each direction on I-215. A third mainline lane has since been constructed in each direction within the median of I-215 as part of a separate project (EA 08-0F1624).

00-1.02 NOTICE:

The "Proposal and Contract" book has been re-titled and is now the "Bid" book. These terms shall be considered as equivalent.

The "Contractor's Proposal" has been re-titled as is now the "Bid". These terms shall be considered as equivalent.

The "Notice to Contractors" has been re-titled and is now the "Notice to Bidders". These terms shall be considered as equivalent.

Bidders are advised that, as required by federal law, the County of Riverside is implementing new Disadvantaged Business Enterprise requirements (June 2012). Section 16, of the Instructions to Bidders, titled "Disadvantaged Business Enterprises (DBE)" cover the DBE requirements. Additionally, other DBE requirements are covered, but not limited to, Instructions to Bidders Section 17 titled "Subcontractor and DBE Records", Section 18 titled "Performance of DBE" and Section 19 titled "DBE Certification Status".

00-1.03 TIME OF COMPLETION:

The Contractor shall diligently prosecute the work to completion before the expiration of 360 working days from the date stated in the "Notice to Proceed".

00-1.04 "NOT USED"

00-1.05 LIQUIDATED DAMAGES:

The Contractor shall pay to the County the sum of **\$ 8,300.00 per day**, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed in Time of Completion Special Provision.

Additional Liquidated Damages:

Project Appearance

If the Contractor fails to comply with the requirements of Special Provisions Section (00-1.25) include number, "PROJECT APPEARANCE" the Contractor shall pay to the County of Riverside the sum of **\$500.00** per day for each and every calendar day's delay after the expiration of 48 hours notification from the Engineer.

00-1.05.1 ADDITIONAL WORKING DAY RESTRICTIONS AND LIQUIDATED DAMAGES:

The 1st working day is the 15th day after the issuance of the Notice To Proceed.

Notice to Proceed will not be issued and contractor will not be allowed to start work at the job site until the Engineer approves your submittal for:

1. Baseline Progress Schedule (Critical Path Method),
2. Storm Water Pollution Prevention Plan (SWPPP),
3. Traffic Control Plan,
4. Notification of Dispute Resolution Advisor (DRA) or Dispute Review Board (DRB) nominee and disclosure statement as specified in Section 5-1.15, "Dispute Resolution," of the Standard Specifications.
5. Contingency plan for opening closures to public traffic

You may enter the job site only to measure controlling field dimensions and locating utilities. Do not start other work activities until all the submittals from the above list are approved. Additionally, the following information must also be submitted and accepted:

1. Notice of Materials To Be Used.
2. Contingency plan for reopening closures to public traffic.
3. Written statement from the vendor that the order for the sign panels has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
4. Written statement from the vendor that the order for electrical material has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
5. Written statement from the vendor that the order for structural steel has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.

You may start work at the job site before the 15th day after the issuance of the Notice to Proceed if:

1. You obtain required approval for each submittal before the 15th day.
2. The Engineer authorizes it in writing.

The Department grants a time extension if a delay is beyond your control and prevents you from starting work at the job site on the 1st working day.

00-1.06 TRAINING:

For the Federal training program, the number of trainees or apprentices is 12.

See Appendix E, Caltrans LAPM, Exhibit 12-E Attachment B, Form FHWA 1273. The Training Section of the Federal Required Contract Provisions for Federal Aid Construction Contracts does apply to this project.

00-1.06.1 FEDERAL REQUIREMENT TRAINING:

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by these Special Provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being

administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the County prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

Payment

The Contractor will be compensated for the training cost in accordance with Caltrans Standard Specifications and LAPM for Federal Trainee Program and no additional compensation and markup will be allowed therefor.

00-1.07 ADDITIONAL FEDERAL REQUIREMENTS:

In addition to the requirement in the Instruction to Bidders, General Conditions, Special Provisions, and elsewhere in the Contract Documents, refer to **Appendix E** for Additional Federal Requirements and Forms.

00-1.08 ADDITIONAL INSURANCE REQUIREMENTS, ADDITIONAL INSURED LIST:

In addition to the requirements of General Conditions Section 4, "Insurance and Hold Harmless" of these contract documents, the Contractor's Certificate of Insurance and additional insured endorsements for the project shall name the following listed entities as additional insured under the Contractor's general liability, excess liability, and auto liability insurance policies, and each listed entity shall be named on the Waiver of Subrogation for the Contractor's Workers Compensation policy.

1. The City of Menifee, its elected and appointed officials, employees, agents, and representatives,
2. State of California, Department of Transportation, its elected and appointed officials, employees, agents, and representatives,
3. Riverside County Transportation Commission (RCTC), its elected and appointed officials, employees, agents, and representatives,
4. WRI Golden State, LLC, its elected and appointed officials, employees, agents, and representatives,
5. Eastern Municipal Water District (EMWD), its elected and appointed officials, employees, agents, and representatives,
6. Southern California Gas Company, its elected and appointed officials, employees, agents, and representatives,

Each of the above listed entities shall also be held harmless, in accordance with the requirements of General Conditions Section 4, "Insurance and Hold Harmless" of these contract documents.

Payment

Full compensation for compliance with the requirements of this Section shall be considered as included in the various items of work, and no additional compensation will be allowed therefor.

00-1.09 ADDITIONAL INSURANCE REQUIREMENTS, COURSE OF CONSTRUCTION INSURANCE:

The Contractor shall provide evidence of insurance and the required endorsements in accordance with these Special Provisions and shall declare all terms, conditions, coverage, limits, and policy deductible.

Contractor shall provide All Risk Builder's Risk (Course of Construction) insurance, including earthquake and flood, property at off-site storage locations and while in transit. Coverage shall include collapse, faulty workmanship debris removal, expediting expense, Fire Department Service charges, valuable papers and records, trees, grass, shrubbery and plants. Policy shall be written on a completed value form. Policy shall also provide coverage for temporary structures (onsite and offices, etc.), fixtures, machinery and equipment being installed as part of the construction project and Business Interruption coverage.

Contractor shall insure its own machinery, equipment, tools, etc., from any loss of any nature whatsoever. Coverage must be provided for the full term of construction, for the full value of the contract, with the following entities being named as insured or additionally insured regarding their respective interests under this contract:

1. Prime Contractor
2. All Subcontractors
3. County of Riverside
4. All owner's of right of way affected by this construction contract.
5. All owners of utilities affected by the construction contract.

The occurrence limit of the Course of Construction Insurance shall be for the full value of the contract. Course of Construction insurance shall include coverage for earth movement and flood damage, for the full value of the contract.

Course of Construction coverage shall be for all work included in the construction contract, as awarded by the County of Riverside.

Your attention is directed to Section 00-1.12, "Progress Payment Restrictions" of these Special Provisions.

Payment

Full compensation shall be considered as included in the lump sum price for Course of Construction Insurance, and no additional compensation will be allowed therefor.

00-1.10 "NOT USED"

00-1.11 ENCROACHMENT PERMIT:

Prior to start of work within the State of California's right-of-way or work affecting the State of California facilities, the Contractor will be required to obtain an Encroachment Permit.

It shall be the responsibility of the Contractor to obtain a duplicate State of California Department of Transportation (Caltrans) Encroachment Permit, and pay all fees required for the work done within State Right-Of-Way prior to commencing any work. All work shall comply with the Caltrans issued permit. The Encroachment Permit from Caltrans is at no cost to the Contractor.

It shall be the responsibility of the Contractor to obtain a City of Menifee Encroachment Permit for work within their jurisdiction or (Right of Way). The City of Menifee Encroachment Permit is at no cost to the Contractor.

Payment

Full compensation for conforming to the requirements of this section, shall be considered as included in the contract prices paid for the various item or work and no additional compensation will be allowed therefore. All incidental costs incurred by the Contractor shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

00-1.12 PROGRESS PAYMENT RESTRICTIONS:

Attention is directed to Sections 9-1.16, "Progress Payments" and 9-1.17, "Payment After Contract Acceptance" of the Standard Specifications and these Special Provisions.

For the purpose of making progress payments pursuant to Section 9-1.16, "Progress Payments" of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work, which will be recognized for progress payment purposes.

A. Course of Construction Insurance	\$ 72,000.00
B. Prepare SWPPP	\$ 30,000.00
C. Mobilization	\$ 1,520,400.00
D. Resident Engineers Office	\$ 200,000.00
E. Progress Schedule (Critical Path Method)	\$ 10,000.00
F. Clearing and Grubbing	\$ 40,000.00
G. Roadside Clearing	\$ 5,000.00
H. Develop Water Supply	\$ 30,000.00

After acceptance of the contract pursuant to the provisions in Section 5-1.46, "Final Inspection and Contract Acceptance" of the Standard Specifications, the remaining payable amount, if any, payable for a contract item of work in excess of the maximum assigned value hereinabove listed for progress payment purpose will be included for payment in the first estimate made after acceptance of the contract.

Excluding the items listed in Section 9-1.16C of the Special Provisions, no progress payment will be made for any materials ordered, furnished, delivered and/or stored that are not incorporated in the construction project.

00-1.13 RECORD DRAWINGS:

The Contractor shall keep one clean set of bond originals to note any changes which take place during construction. These changes to the original plans and/or specifications shall be noted at the appropriate locations with the appropriate changes indicated in red pencil or ink. The Contractor shall note in large letters "RECORD DRAWINGS" on the Title Sheet of the plans. The project will not be accepted as finalized by the Engineer until these record drawings have been completed to the satisfaction of the Engineer. The changes shall be noted on the plans as the changes occur. The record drawings shall be submitted to the Resident Engineer, and become the property of the County at the conclusion of this project.

Payment

Full compensation for maintaining and compiling the Record Drawings shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

00-1.14 COOPERATION:

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

Attention is directed to Section 5-1.36D, "Non-highway Facilities," of the Standard Specifications.

Should construction be under way by other forces, or by other Contractors, adjacent to the work specified, the Contractor shall cooperate to avoid delay or hindrance to such construction.

It is anticipated that work by another Contractor may be in progress adjacent to or within the limits of this project during progress of the work on this contract. The following table is a lists of contracts anticipated to be in progress during this project.

Contract No.	Co-Rte-KP	Location	Type of Work
08-0F1624	Riv-215-PM R14.2/R28.5	Menifee, Perris	Highway Construction

The Contractor shall communicate on a regular basis with the other Contractors and agencies responsible for the other near vicinity interchanges.

Given the proximity of the interchanges, inter-project coordination regarding schedule and closures will be essential for efficient operation and traffic handling at each project. All ramp and lane closures will be subject to coordination with adjacent interchange project schedules.

Contractor is required to attend all construction progress meetings for this project.

Should construction be under way by other forces or by other Contractors within or adjacent to the limits of the work specified or should work of any other nature be under way by other forces within or adjacent to those limits, the Contractor shall cooperate with all the other Contractors or other forces to complete

their work without causing any delay or hindrance to their work. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

When two or more Contractors are employed on related or adjacent work, or obtain materials from the same material source, as provided in Section 6-2.02, "Material Source" or Section 6-2.04, "Local Materials", each shall conduct their operations in such a manner as not to cause any unnecessary delay or hindrance to the other.

Each Contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by their operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

A Traffic Safety Team will be required for this project. The Contractor shall plan on having no less than a Superintendent attend two of these meetings a month for a minimum of one hour. The Engineer will set up meetings as determined necessary. The cost of attending these meetings shall be included in the cost of performing traffic control and no additional compensation will be provided therefor.

Payment

Full compliance with the requirements of this item including cooperating and coordinating with other Contractors, shall be considered as included in the various items of work, and no additional compensation will be allowed therefor.

00-1.15 PARTNERING:

Attention is directed to Section 5-1.09, "Partnering" of the Standard Specifications.

The County of Riverside will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the County of Riverside and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator and of the expenses for obtaining the workshop site. The County's share of such costs will be reimbursed to the Contractor in a change order written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

00-1.16 "NOT USED"

00-1.17 NOTICE TO PROPERTY OWNERS:

The Contractor shall be responsible to distribute an information letter pertaining to the planned work to all affected residences and businesses, at least one week prior to commencing work adjacent to those residences and businesses. It shall be the responsibility of the Contractor to design the information letter, obtain design approval from the Engineer, print sufficient copies, and distribute the letter. The Transportation Department logo shall be included on the letter. A computer file of the logo may be

obtained from the Engineer. The letter shall be similar to a sample to be provided by the Engineer, and shall include a project description, the scope of work, the anticipated construction schedule, and other information as appropriate.

The Contractor shall post temporary no parking signs on affected streets 24 hours prior to work on those streets. The temporary no parking signs shall state the anticipated dates and hours of work on those streets.

Payment

Full compensation for preparing and distributing Notice to Property Owners shall be considered as included in the Lump Sum price bid paid for Traffic Control System and no additional compensation will be allowed.

00-1.18 "NOT USED"

00-1.19 "NOT USED"

00-1.20 JOB SITE POSTERS:

Contractor shall obtain, furnish, post, preserve and maintain notices and posters in areas readily accessible to all personnel. Areas include, but are not limited to, jobsite trailer common area, material staging area, designated area where employees meet to take shift breaks, and /or equipment storage area. The designated location(s) of posters must be approved by the Engineer.

If posters are placed outside, they will need to be weatherproofed.

Copies of the posters may be obtained at the Caltrans Division of Construction Website:

<http://www.dot.ca.gov/hq/construc/LaborCompliance/posters.htm>

The Contractor shall check the website periodically for poster updates, additions, and changes. Contact information for various government agencies associated with poster information are provided at this website with links.

The following is a list of required posters:

Document number	Poster Name	Note/ Comment
-	Notice of Labor Compliance Program Approval	Required in English and Spanish and for all projects.
DFEH 162	Discrimination and Harassment in Employment are Prohibited by Law	Required in English and Spanish and for all projects.
DSLE 8	Payday Notice	Required for all projects.
WH Publication 1321	Davis-Bacon Act Poster (Notice to All Workers Working on Federally Financed Construction Projects)	Required in English and Spanish and for Federally funded projects.
FHWA 1495	Wage Rate Information Federal-Aid Highway Project	Required in English and Spanish and for Federally funded projects.

EEOC P/E-1	Equal Employment Opportunity is THE LAW (Revised 11/09)	Required in English and Spanish and for Federally funded projects.
FHWA 1022	False Statement Notice	Required for Federally funded projects.
OSHA 3165 (3167-Spanish)	Job Safety and Health – It's the law!	Required in English and Spanish and for Federally funded projects.
WHD Publication 1088	Employee Rights Under the Fair Labor Standards Act (Revised July 2009)	Required for Federally funded projects.
WHD Publication 1420	Employee Rights And Responsibilities Under The Family And Medical Leave Act (Revised January 2009)	Required for Federally funded projects.
WH Publication 1462	NOTICE Employee Polygraph Protection Act (June 2003)	Required for Federally funded projects.

Though not posters, but included in the listing above, are the Federal (Davis-Bacon) wage rates and the California State prevailing wage rates, which are applicable to this specific contract, and also to be posted at the job site. See Appendix D, "Federal Prevailing Wage Decision" or see correlated addendum that updates this referenced section.

Additionally, copies of the U.S. Department of Transportation Federal Highway Administration (FHWA) posters may be obtained at the FHWA Website:

<http://www.fhwa.dot.gov/programadmin/contracts/poster.cfm>

The revision dates shown in this listing were current as of April 20, 2010.

Payment

Full compensation for obtaining, furnishing, posting, preserving and maintaining all notices and job site posters shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

00-1.21 BUY AMERICA REQUIREMENTS:

Refer to Section 6-2.05, "Buy America" of the Standard Specifications.

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coating that protects or enhances the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance, conforming to the provisions in Section 6-3.05E, "Certificates of Compliance" of the Standard Specifications, shall be furnished for steel and iron materials. The certificates, in addition

to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

00-1.22 OBSTRUCTIONS

Attention is directed to General Condition's item 29, "Obstructions".

Attention is directed to Sections 5-1.36, "Property and Facility Preservation", 15, "Existing Facilities" 7-1.05 "Indemnification" and 7-1.06 "Insurance" of the Standard Specifications and these Special Provisions.

Existing utility and privately owned facilities shall be protected in accordance with Section 5-1.36, "Property and Facility Preservation" and these Special Provisions. The Contractor is also responsible to protect those facilities that are to be relocated by others prior to or during construction, and shall protect those facilities in both their existing and their ultimate locations. The Contractor shall cooperate with owners and their Contractors of utility and privately owned facilities, for the relocation of said facilities, in accordance with Section 5-1.20, "Coordination with other Entities" of the Standard Specifications.

All water valves and covers, gas valves and covers, sewer manholes, survey monuments, survey markers and any other utility appurtenances shall be protected in place.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workmen and the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipe lines greater than 6 inches in diameter or pipe lines operating at pressures greater than 60 psi (gage); underground electric supply system conductors or cables either directly buried or in duct or conduit which do not have concentric neutral conductors or other effectively grounded metal shields or sheaths; and underground electrical conductors with potential to ground of more than 300 volts. The Contractor shall notify the Engineer at least twenty-four hours prior to performing any work in the vicinity of such facilities.

Attention is directed to the requirements of Government Code Sections 4216-4216.9 pertaining to existing utility facilities.

The Contractor shall assume that every house, building and lot within the project limits has utility service pipes and conductors (laterals), and that utility main and trunk facilities exist within the project limits. The Contractor shall determine if it is warranted to determine the exact location of these utility service laterals and existing main lines, unless directed by the Engineer to pot-hole at specific locations, or as otherwise required herein. The Contractor will not be directly reimbursed for determining the exact location of the utility main lines or services laterals but shall include any compensation for this work in the contract price paid for the various items of work. Any damage to existing main lines or service laterals for which pot-holing was not performed shall be considered damage due to not using reasonable care and the damage shall be repaired at the Contractor's expense.

The Contractor shall conduct his operations with the assumption that underground utility facilities exist within the project limits. The Contractor shall exercise caution and best construction practices for safety and for protection of underground facilities. The approximate locations of underground utility facilities, as shown on the plans, are based on information provided by the respective owners, listed below. The Contractor shall also utilize the markings of the regional notification center (Underground Service Alert),

and above-ground utility appurtenances to determine the existence and approximate location of underground utilities.

No excavation shall be made within 4 feet of any underground utilities, as shown on the plans and/or marked by Underground Service Alert, unless and until such utilities have been positively located as to horizontal and vertical position. This requirement applies to all underground electric, natural gas, toxic or flammable gas, chlorine, oxygen or petroleum, fiber optic, facilities.

The Contractor is advised that abandoned or active utility facilities may exist within the project limits, which were not known to the design engineer and which are not shown on the plans. The Contractor shall immediately inform the Engineer if any such utility facilities are encountered within the project limits so that resolution can be initiated if a conflict exists. Any utility facilities that have been encountered, and which have been determined by the Engineer to be abandoned, shall be cut and capped and disposed-of as directed by the Engineer. Removal, capping and disposal of abandoned utility conduits, conductors, pipe and other facilities shall be considered as incidental excavation, and shall be included in the contract unit price for Clearing and Grubbing or Excavation, and no additional compensation will be allowed therefor.

In the event that the Contractor encounters abandoned or active Asbestos Cement pipe, or any other utility facility containing or suspected of containing asbestos, the Contractor shall immediately notify the Engineer, and will cease work in the vicinity of the encountered material. The Engineer will endeavor to have any such conflicting facilities removed or relocated by the owner of the facilities. If so ordered by the Engineer, the Contractor or his sub-contractor will remove and dispose of abandoned utility facilities containing or suspected of containing asbestos accordance with the health and safety requirements for handling the material, using properly trained and licensed personnel. Said work shall be considered as extra work.

Forty-eight hours prior to beginning construction, the Contractor shall notify the following agencies:

Underground Service Alert	800-227-2600
Southern California Edison Company	909-820-5679
Southern California Edison Company - Distribution	951-928-8323 ext. 18323
Southern California Edison Company - Transmission	909-820-5514 ext. 12514
Southern California Gas Company - Distribution	909-335-7879
Verizon Communications	951-537-8570
Time Warner Cable	951-547-3828
Eastern Municipal Water District	951-928-3777 ext. 4450
AT&T (Long Distance)	714-963-6793
Sunesys	951-858-9578
MediaCom	602-295-5213

Payment

Full compensation for all costs, including labor, equipment, materials and incidentals, required to comply with the requirements of this section above, including protection of water valves and covers, gas valves and covers, sewer manholes, survey monuments, survey markers and any other utility appurtenances, shall be considered as included in the various items of work, and no additional compensation will be allowed therefor.

Adjustments to Grade for Obstructions

The Contractor shall adjust to finish grade any valve covers encountered within the project limits, as required, for those utility valves that are provided with slip cans and are adjustable without the replacement of parts or the removal of concrete collars. In cases where the owning utility company insists upon upgrades in the standards, or when additional parts or the removal of concrete collars are required for the adjustment, said adjustment will be the responsibility of the owning utility company.

Communication and coordination with the owning utility company shall be the responsibility of the contractor.

For public safety, traffic shall not be allowed on temporary or permanent pavement until all manholes are either adjusted to grade or otherwise protected, as approved by the Engineer. The Contractor shall adjust to grade manholes and valves when and as necessary for the protection of the traveling public during construction, and shall coordinate all work on said facilities with the owning utility companies. This requirement is intended for traffic that is to be allowed on temporary surfaces during the course of construction. Final adjustment to grade will be the responsibility of the owning utility company, except as provided herein.

Said work shall be performed in accordance with Section 15-2.10B, "Adjust Frames, Covers, Grates, and Manholes" of the Standard Specifications. Full compensation for adjustment of valve covers shall be considered as included in the contract price paid for asphalt concrete or applicable items of work in the event that there is no asphalt concrete bid item, and no additional compensation will be allowed therefor.

All existing utility facilities shall be protected from damage by the Contractor's operations.

Unless otherwise provided herein, the owning utility companies will not be obligated to lower their surface utilities (manholes and valve covers) for Contractor's grading, grinding and/or paving operations. The contractor shall lower surface facilities, including manholes and valve covers, to facilitate construction, and the following shall apply:

1. Contractor shall coordinate all work with the utility owner.
2. Contractor shall be responsible for all costs and shall be responsible for any damage caused to the owner's facilities. If the Contractor observes any pre-existing damage to the utility facilities, the Contractor shall notify the Engineer and the utility owner of that damage prior to performing additional work on the facility.
3. Contractor shall, after removing grade rings and covers, arrange for pickup by, or delivery to, the owner's yard. Any and all concrete collars removed by the Contractor shall become the property of the Contractor, and shall be disposed of as specified elsewhere in these special provisions.
4. The Contractor is advised that he is responsible for ensuring that construction materials do not enter the utility owner's facilities. The Contractor shall install traffic bearing steel plates for this purpose, and provide all coordination and transportation necessary. It is recommended that the Contractor request the utility owner to provide such steel plates. If the Contractor provides steel plates, it shall be the Contractor's responsibility to coordinate with the utility owner for the return of the steel plates to the Contractor after final adjustment to grade. If the Contractor utilizes utility owner's steel plates, and if the Contract items of work include adjustment to final grade, the Contractor shall return the steel plates to the Utility owner's yard, or as otherwise arranged with the Utility owner.
5. Prior to paving or covering the plated utility facility, the Contractor shall tie-out the facility utilizing a method acceptable to the utility owner and provide notes and data of all covered facilities to both the utility owner and the Engineer.
6. The Contractor shall notify the utility owner, upon completion of the Contractor's work, when the utility owner may move in to make the final adjustments to grade.

7. The requirements for lowering of surface facilities shall not apply to vaults. The Contractor shall notify the utility owner of the need to make adjustments to such major facilities.
8. The Contractor is reminded that the utility facilities are owned by public and private utility companies that operate their facilities within public rights of way. The utility owner's preferences with regards to the handling of its facilities shall be complied with to the greatest extent possible.
9. Contractor shall repair damaged signals detector loops

Payment

Full compensation for initial lowering of surface utilities facilities shall be considered as included in the contract price paid for Hot Mix Asphalt type A or Type C, and no additional compensation will be allowed therefor.

00-1.23 DISPOSAL OF EXCESS EXCAVATION OR MATERIALS:

Attention is directed to Section 16-1.03D, "Disposal of Materials", of the Standard Specifications and these Special Provisions.

Excess earth excavation, pavement grindings and other excess materials resulting from construction operations shall be disposed of by the Contractor outside of the highway right of way.

When any material is to be disposed of outside the highway right of way, and the County has not made arrangements for the disposal of such material, the Contractor shall first obtain written authorization from the property owner on whose property the disposal is to be made, and obtain all required permits from the jurisdictional agency(s) for said work, and Contractor shall file with the Engineer said authorization or a certified copy thereof together with a written release from the property owner absolving the County from any and all responsibility in connection with the disposal of material on said property. If the disposal of materials is to be made at an established disposal facility that is available for public use, the Contractor shall retain all authorizations and receipts from said disposal facility and shall provide copies to the Engineer upon request.

Payment

Full compensation for all costs involved in disposing of materials as specified in this section, including all costs of hauling, shall be considered as included in the various contract items of work and no additional compensation will be allowed therefor.

00-1.24 GRAFFITI REMOVAL AND CLEANING:

The Contractor shall remove existing graffiti within the project limits and any new graffiti produced during the construction period of the project.

Contractor shall submit a method of graffiti removal plan to the Engineer for approval. Sand blasting will not be allowed. Methods may include but not limited to power washing, solvent washing, and painting over graffiti, as appropriate for the surface to be cleaned.

All graffiti shall be completely removed or obliterated and the area feathered out to hide any imperfections.

Graffiti shall be removed from, but not limited to, the surfaces listed as follows: bricks, cinder blocks, concrete sidewalks, pavement, bridge under passes, overhead structures, drainage channels, roadside signs, temporary construction signs, barricades, k-railing, traffic control devices, all types of poles, and other objects within the project limits as directed by the Engineer. Painting of k-railing for the purposes of graffiti removal shall not be considered as repainting as outlined in paragraph one of Section 12-3.08B(1), "General," of the Standard Specifications and shall not be paid for as extra work.

Graffiti to be removed may include, but shall not be limited to: paint, signs, wood, metal, plastic, decals, gum, markers, crayons, ropes, chains, strings, wires, and tapes of any kind on an as needed basis.

All painting over graffiti must be done with exact color matches, so as not to show any blocking or shadowing of colors. Painting over graffiti is the preferred option on previously painted surfaces, and where solvents are unsuccessful at removing graffiti. Painting services shall be done on an as needed basis on the following types of surfaces, but not limited to: walls, hardscapes, poles, fences, bollards, railings, and buildings.

Paint shall be exact color match. Paint types may include oil base, water base and enamels as approved by the Engineer. Graffiti cover-up by paint will be allowed with appropriate type of paint at locations where graffiti cannot be removed only upon direction by the Engineer. All paint applications shall adhere to the manufacturer's recommendations. All material and solutions shall be safe and biodegradable and approved by the Engineer.

Regional Water Quality Control Board (RWQCB) and Air Quality Management District (AQMD) regulations, as well as all NPDES required best management practices shall be complied with and followed.

The Contractor shall so conduct his operation as to cause the least possible obstruction and inconvenience to public traffic. The Contractor shall provide, erect and maintain barricades, lights, danger signals, and warning signs as deemed appropriate by the Engineer.

When necessary, the Contractor shall provide and erect safe and adequate scaffolding and equipment, barriers, and masking, required for the proper execution of the work. All scaffolding shall be properly braced and erected to insure the safety of the workmen and meet all appropriate OSHA regulations.

The Contractor shall respond and provide manpower for any urgent graffiti removal and cleaning notifications within two (2) working days.

Urgent graffiti will be classified as any graffiti that causes a safety hazard for motorists and affects the traffic flow as determined by the Resident Engineer.

This work will be monitored/controlled by the construction Resident Engineer. The Contractor must coordinate the work with the Resident Engineer during the construction.

Payment

Full compensation for conformance with these Graffiti Removal and Cleaning requirements, including labor, equipment, materials, necessary traffic control, and incidentals, shall be paid at the lump sum price for Job Site Management, and no additional compensation will be allowed therefor.

00-1.25 PROJECT APPEARANCE:

Attention is directed to General Condition 28, "Use, Care and Protection of Premises."

The Contractor shall maintain a neat appearance to the worksite. The parkway between the pavement and property line is generally maintained free of trash and debris by the adjacent property owners. The Contractor shall inform all workers to be respectful of the property owners and maintaining the parkways and street adjacent to their homes.

The Contractor must maintain a neat appearance to the work.

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

- A. When practicable, broken concrete and debris developed during clearing and grubbing shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed of weekly.
- B. Trash bins shall be furnished for debris from structure construction. Debris shall be placed in trash bins daily.

- C. Forms or falsework that are to be re-used shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be re-used shall be disposed of concurrently with their removal.

Prior to the leaving the project site daily, the Contractor shall collect and dispose of any trash or debris within the project area.

Payment

Full compensation for conforming to the requirements of this section, Project Appearance, shall be considered as included in the various items of work involved and no additional compensation will be allowed therefor.

See Section 00-1.05, "Liquidated Damages", of these Special Provisions for penalties associated with non-compliance.

00-1.26 SURVEY STAKING:

Section 5-1.26, "Construction Surveys" of the Standard Specifications is deleted and replaced with the following provisions.

County surveyors will establish external primary survey control monuments and/or marks to be used throughout the construction period. These control monuments and marks are to be protected by Contractor and will be used to set construction stakes and/or marks. The control marks will also be used to make verification surveys at various stages of work.

Survey monuments, stakes and marks are set per the County's Survey Manual.

Contractor must submit a written request for County furnished construction staking before, or immediately after, area to receive staking is ready for the installation of the construction stakes.

The County will provide Contractor with a survey request form. Survey staking requests must be received from Contractor a minimum of two (2) Business Days prior to the installation of the requested construction staking. The County shall receive written survey request on operating Business Day, Monday through Thursday, and prior to 4:00 p.m. Requests received after 4:00 p.m. or on any other day, shall be considered as submitted at 7:30 a.m. the next Business Day.

Contractor must preserve primary survey control monuments and marks, construction stakes and construction marks placed by the County. Survey costs are incurred by the County; however, if the Contractor fails to protect and/or destroys these survey items, the County shall replace them at the County's earliest convenience and deduct the cost of replacement from payment due to the Contractor.

00-1.27 MOBILIZATION, DEMOBILIZATION AND FINAL CLEANUP:

Mobilization shall consist of preparatory work and operations, including, but not limited to those necessary for the movement of personnel, equipment, supplies and incidentals to the project site and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site.

De-mobilization shall consist of the completion of all final construction and administrative work required to secure the project for termination and acceptance by the Engineer, including, but not limited to the following:

1. Satisfactory completion of Finishing Roadway in accordance with Section 22, "Finishing Roadway" of the Standard Specifications;

2. Removal of all temporary facilities, construction office, temporary utilities, temporary BMPs, plant, equipment, surplus material, construction debris and similar from project limits and adjacent property, as required and as directed by the Engineer;
3. Restoration of all temporary roads and haul routes and construction storage and office areas, etc. to original or better condition;
4. Completion of record of drawings (as-built), to the satisfaction of the Engineer;
5. Submission of final Disadvantaged Business Enterprise report to the Engineer;
6. Submission of final certified payroll documents to the Engineer;
7. Submission of property owner releases, as required by the Engineer;
8. Completion of the requirements of permits issued by other agencies;
9. Satisfactory completion of all other contractually and legally required construction and administrative items of work.

De-Mobilization shall include the satisfactory completion of all items of work, but shall not be construed as being a separate payment for work that is paid under separate contract items. The De-Mobilization is intended for proper close-out activities.

Payment

- A. The following schedule will be used to determine measurement of mobilization, demobilization and final cleanup and disbursement of the bid price for mobilization, demobilization and final cleanup:

Percent of Contract work Completed (\$ Expended/ \$ Total Contract Price)	Percent of Mobilization, Demobilization, and Final Cleanup Considered to be Complete (Compensated for)
10% - 20%	40%
21% - 40%	55%
41% - 60%	70%
61% - 80%	85%
Upon Demobilization and Final Cleanup	100%

- B. Payment of Mobilization, Demobilization and Final Cleanup work shall be based upon the lump sum bid price for "**Mobilization**" Payment shall constitute full compensation for all labor, material, equipment, and all other items necessary and incidental for completion of this item of work. The deletion for work or the addition of extra work, as provided for herein, shall not affect the price paid for Mobilization, Demobilization, and Final Cleanup.

00-1.28 RESIDENT ENGINEER'S OFFICE:

00-1.28A General

You must furnish and maintain a Resident Engineer's Office (Field Office), suitable for the intended purpose, for the exclusive use of the Engineer and his staff.

You must make all arrangements for utility hook-ups, and pay all connection and monthly fees.

You are to be aware that theft and vandalism at the job site may be a problem. You are responsible for the security of the Field Office.

If for any reason, the phone, copier, facsimile machine, any office furniture, and/or sanitary facility is vandalized, stolen, or in need of repair, upon receipt of written notice by Engineer, you shall have a maximum of 5 working days to replace or repair the items to full working order. If you fail to comply with the 5 working days specified, the County may, at its option, withhold monthly progress payments until Field Office is returned to full and complete working order.

00-1.28B Material

The Field Office must be a 1200 square foot (minimum) office facility with required utility hook ups, including electricity, potable water, sewage disposal, 2 telephone lines, multi-line speaker phones, internet service, and air conditioning. The facility must have two restrooms and partitions creating 3 interior rooms. You must obtain all necessary permits, pay monthly rental fees, and obtain all rights of entry necessary.

The Field Office must be provided with a facsimile machine with a separate phone line and a copying machine capable of photocopying 11" x 17" size paper for the exclusive use of the Engineer and the Engineer's staff for the entire duration of the project.

The following must be furnished and supplied by you for the duration of the contract:

1. Furnish, service and maintain office. The following office furniture, in new condition, must be furnished, at a minimum:
 - 4 ea. 30" x 60" desks with lockable drawers
 - 4 ea. task swivel chairs
 - 1 ea. conference table to accommodate 10 conference chairs.
 - 10 conference chairs
 - 3 ea. 60"H x 40"W x 16"D book shelf
 - 2 ea. 60" x 36" drafting table and chair
 - 2 file cabinets (4-drawers)
2. Supply utilities for office, including electricity, phone (2 lines), potable water, and DSL, Roadrunner or FIOS, as approved, internet service for the duration of the contract, including fees.
3. Supply, service and maintain sanitary facility.
4. Facsimile machine (separate phone line) must be current model or as approved.
5. Furnish 2 current model personal computers for the duration of the contract, suitable and capable for office use, internet connected utilizing DSL service, and complete with necessary software including Microsoft Office, latest version. Personal computers may be desktops or laptops, must be new, and shall be as approved. Processors must be i7 with a Windows Experience score greater than 6.0 or as approved by the Resident Engineer.
6. Two color laser printers, HP Color Laserjet Model 2605DN (also known as Q7822A) or approved alternate. At least one Xerox Workcenter 7346 with professional finisher or equivalent multifunction printer capable of printing 11" x 17" at least 40 ppm color, fold, staple, and hole punch as approved. The printer and scanner are to be network capable with all computers. Include internet printing and scanning setup for all County furnished laptops and computers. All supplies and necessary maintenance for the use of the above equipment by the Engineer shall be furnished and supplied by the Contractor for the duration of the contract.
7. Copying machine (11" x 17"), capable of making color copies.
8. Installation of 4 designated public parking spaces.
9. Installation of appropriate number of designated parking spaces for the construction manager, inspectors, general Contractors, workers, material suppliers, subcontractors and other support personnel.

10. Installation of 1 large sized unit commercial trash bin with cover and regularly scheduled pick up.
11. Field office shall have a 24" x 36" sign, white color, affixed near the door. The sign text shall read "COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT" and shall have County seals affixed to it. Contractor will be supplied the seals by the County.
12. Remove office from job site at the completion of the project.
13. Security.
14. If office is located on private property, all property rental costs and right of entry.
15. Furnish a 20 CF refrigerator and one microwave oven.
16. Water cooler dispenser and bottled water for use with the dispenser.
17. Bottled water supply (16-20 oz.) for inspectors for the duration of the project.
18. One 2TB (WD My Passport or approved equal) external hard drive with network capabilities.
19. Wireless internet service either through internet service provider or provide wireless router (Asus RT-AC66U or approved equal). Also furnish an additional 4G wireless network card.
20. Furnish all office supplies including pens, pencils, highlighters, notepads, (3) multi-outlet power strips, post-it note pads, paper clips, binder clips, rubber bands, staplers, folders, paper shredder, (2) 40 sheet capacity 3-hole puncher, (5) trash cans, copier and printer paper.
21. Two (2) dry erase whiteboard 4' x 6' or larger and dry erase markers.
22. Coffee machine with regular maintenance and delivery of coffee, creamer, sugar and artificial sweeteners.
23. Monitoring Camera (Pole and Electrical Service).

00-1.28C Construction

You must meet with the Engineer prior to construction (and at any other time circumstances warrant), and together, shall mutually agree on a location for the field office. Approval of the proposed Field Office by the Engineer shall be obtained before implementation.

The Field Office must be maintained in a clean, neat and sanitary manner at all times. All sanitary paper products required for the restroom must be supplied by you.

00-1.28D Payment

Full compensation for Resident Engineer Office will be paid per lump sum, which shall include furnishing and maintaining RE office as specified herein. No monthly progress payments will be due you until all provisions and requirements of "Resident Engineer's Office" are complete and in place.

00-1.29 CONSTRUCTION ZONE ENHANCED ENFORCEMENT PROGRAM (COZEEP):

COZEEP improves project safety through the use of supplemental California Highway Patrol Units to assist in the management of traffic passing through the construction zone. COZEEP involves the presence of the CHP in certain construction zones to serve as a reminder to the public to slow down, observe construction zone signs, and use care while driving through the work zone.

COZEEP shall be considered when above normal traffic problems are anticipated or unique conditions warrant additional public or worker protection.

The Contractor shall coordinate with the Resident Engineer when COZEEP services are needed from the California Highway Patrol.

00-1.30 AIR QUALITY – NESHAP ASBESTOS NOTIFICATION

The Contractor must notify the Air Pollution Control District (APCD) or Air Quality Management District (AQMD) identified below as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40 CFR Part 61, Subpart M, and California Health and Safety Code section 39658(b)(1). A copy of the notification form and attachments must be provided to the Engineer prior to submittal. Notification must take place a minimum of 10 working days prior to starting demolition or renovation activities as defined in the NESHAP regulations. Notification forms and other information are available from the air district at the address below.

**South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
Telephone: 909-396-2000
Fax: (909) 396-3340**

Forms and information may also be obtained from the air district's web site at:

<http://www.arb.ca.gov/capcoa/roster.htm>

The contractor must mail or otherwise deliver the original notification form with any necessary attachments to:

**South Coast Air Quality Management District
Asbestos Notifications, File #55641
Los Angeles, CA 90074-5641**

The contractor must also notify other local permit agencies and utility companies prior to starting any demolition activities. A copy of the notification form and attachments must be provided to the Engineer a minimum of 30 days prior to the start of work.

If the Contractor does not receive direction from the Engineer within 20 days after submittal that changes to the notification are required, or written confirmation of receipt and approval by the local APCD or AQMD, then an extension of time commensurate with the delay in completion of the work thus caused will be granted and the Contractor will be relieved from any claim for liquidated damages, or engineering and inspection charges or other penalties for the period covered by that extension of time; provided that the Contractor notifies the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer will ascertain the facts and the extent of the delay, and the Engineer's findings thereof must be final and conclusive.

Payment

Full compensation for complying with requirements of this section, including the payment of any notification fees, shall be considered as included in various items of work, and no additional compensation will be allowed therefor.

00-1.31 MATERIAL SOURCE INSPECTION AND TESTING

Refer to section 6-3.05C of Standard Specification.

METS: means Riverside County Transportation Department and /or their designee

00-1.32 PORTABLE CHANGEABLE MESSAGE SIGNS

Add to section 12-3.12D Payment:

The contract unit price paid per each for Portable Changeable Message Sign shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in furnishing, placing, operating, maintaining repairing, transporting from location to location and, vandalism and theft, removing portable changeable message signs when not needed, as specified and as shown on the plans and as directed by the Engineer.

00-1.33 ROADWAY EXCAVATION

Refer to section 19-2 and add the following additional clarification to this section

The excavation and handling of rocks/boulders of more than 2 tons shall be compensated as an extra work by force account. Excavation and handling of rocks/boulders of 2 tons and under shall be considered as included in the bid price paid for Roadway Excavation and no additional compensation will be allowed

Add following to section 19-2.04 Payment

No adjustment in the bid price per cubic yard for overages or underages from the stated quantity will be allowed. Sections 9-1.06B and 9-1.06C of the Standard Specifications do not apply for increases and decreases of pay quantity of more than 25% from the stated quantity.

00-1.34 EMBANKMENT CONSTRUCTION

Embankment construction shall conform to section 19-6 of the Standard Specification

Add to section 19-6.01:

Refer to section 19-6.01 and add the following to second paragraph

5. Multiple handling of embankment material shall be considered as included in bid item for Roadway Excavation, and no additional compensation will be allowed.

00-1.35 PLANT ESTABLISHMENT

Plant establishment period on this project is 36 months

Contractor will be responsible for water billing payments until the plant establishment work is accepted by the Department.

Add to section 20-9.04 Payment:

Payment of water bill shall be considered as included in the contract bid price paid for Plant Establishment Period and no additional compensation will be allowed.

00-1.36 MONITORING CAMERA (POLE AND ELECTRICAL SERVICE)

General

This project includes specifications for construction site monitoring cameras.

It is anticipated that the County of Riverside will contract with a commercial construction site monitoring company, hereinafter referred to as "Vendor," for the installation and maintenance of a construction monitoring camera system.

You must comply with the requirements set forth herein.

Cooperation with the Vendor must comply with section 5-1.20.

You must coordinate and cooperate with the Vendor to establish a suitable location for the camera support pole(s) that will meet the requirements of the camera system, and which will require the fewest number of relocations during the course of construction.

You must meet with the Engineer and the Vendor to determine the best location for the camera system, and to determine the best electrical service option. After installation, and throughout the course of construction, you must protect the camera system, support pole, and electrical service facilities in-place.

Construction

You must provide and install camera system support pole(s) that meets the requirements of the Vendor for the intended equipment. A mounting height of up to 60 feet above the grade at the location of the pole(s) must be provided. The pole(s) must be adequately and safely installed to avoid any possibility of collapse, for the duration of construction.

You must provide for the electrical service to the camera system support pole(s). Electrical service is anticipated to be provided in one of the following ways, as determined by the Engineer:

- 1) Service Option 1: Nearest Edison distribution pole. You must arrange for temporary service from Edison, and must provide all aerial or underground equipment between the service point and the camera support pole(s). You must coordinate with the Vendor to make the necessary electrical connections. A subpanel must be installed if directed by the Engineer to meet the needs of the Vendor. You are responsible for all fees and service payments to Edison. You must provide the Engineer with a copy of the invoices received from Edison.
- 2) Service Option 2: Solar equipment, to be provided and maintained by the Vendor.
- 3) Other service options, Fuel powered generators will not be considered a viable service option.

All equipment that is the property of the Vendor must be protected during the course of construction and must be returned to the Vendor upon completion of the contract work. All temporary poles, conductors, conduits, and associated equipment must be removed from the project site and will remain your property, upon completion of the contract work.

Payment

Full compensation to comply with this provision shall be considered as included in the lump sum bid price paid for Resident Engineer Office and no additional compensation will be allowed.

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*.

DIVISION I GENERAL PROVISIONS

1 GENERAL

Add to section 1-1.01:

Bid Items and Applicable Sections

Item code	Item description	Applicable section
128601A	TEMPORARY SIGNAL SYSTEM (LOCATION 1)	12
128602A	TEMPORARY SIGNAL SYSTEM (LOCATION 2)	12
130901A	TEMPORARY STREAM CROSSING	13
130902A	TEMPORARY CLEAR WATER DIVERSION	13
150658A	REMOVE TEMPORARY TERMINAL SECTION (TYPE K)	15
150802A	REMOVE ROCK SLOPE PROTECTION	15
153123A	REMOVE CONCRETE (CROSS GUTTER) (SQYD)	15
204011A	PLANT (GROUP K) (48" BOX)	20
208610A	1 1/2" PLASTIC PIPE (CLASS 315) (SUPPLY LINE)	20
620184A	33" ALTERNATIVE PIPE CULVERT	62
510100A	12" WELDED STEEL PIPE CASING (BRIDGE)	51
760081A	PERMANENT WATERLINE FACILITIES (LOCATION A AND B)	76
760082A	PERMANENT WATERLINE FACILITIES (LOCATION C)	76
839729A	CONCRETE BARRIER (TYPE 736A MODIFIED)	83
862000A	COMMUNICATION SYSTEM	86

2 BIDDING

Add to section 2-1.06B:

The Department makes the following supplemental project information available:

Supplemental Project Information

Means	Description
Included in the <i>Information Handout</i>	1. Cross Sections

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5 CONTROL OF WORK

Add to section 5-1.09A:

The Department encourages the project team to exhaust the use of partnering in dispute resolution before engagement of an objective third party.

For certain disputes, a facilitated partnering session or facilitated dispute resolution session may be appropriate and effective in clarifying issues and resolving all or part of a dispute.

To afford the project team enough time to plan and hold the session, a maximum of 20 days may be added to the DRB referral time following the Engineer's response to a *Supplemental Potential Claim Record*.

To allow this additional referral time, the project team must document its agreement and intention in the dispute resolution plan of the partnering charter. The team may further document agreement of any associated criteria to be met for use of the additional referral time.

If the session is not held, the DRB referral time remains in effect as specified in section 5-1.43.

Add to section 5-1.20A:

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

Coincident or Adjacent Contracts

Contract no.	County–Route–Post Mile	Location	Type of work
08-0F1624	Riv-215-PM R14.2/R28.5	Menifee, Perris	Highway Construction

Add to section 5-1.23:

Days: mean Working days in this provision

Add to section 5-1.36D:

Installation of the utilities shown in the following table requires coordination with your activities. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing at least the time shown for the utility owner to complete its work

Utility Relocation and Contractor-Arranged Time for the Relocation

Utility	Utility address	Location	Working Days
6" Gas (Southern California Gas Company)	1981 N Lugonia Ave. Redlands, CA 92374	Newport Rd	30
8" Gas (Southern California Gas Company) (Extend Vents)	1981 N Lugonia Ave Redlands, CA 92374	Newport Rd	10
21" Water (Eastern Municipal Water District)	P.O. Box 8300 Perris, CA 92572-8300	Newport Rd	30
Telephone (Verizon)	150 S. Juanita St Hemet, CA 92543	Newport Rd	45
Underground Telephone (Verizon)	150 S. Juanita St Hemet, CA 92543	Shopping Center in SE Quadrant	20
Underground Electrical (Southern California Edison)	26100 Menifee Rd Romoland, CA 92585	Shopping Center in SE Quadrant	20
Underground Electrical (Southern California Edison)	26100 Menifee Rd Romoland, CA 92585	Newport Rd	10
Overhead Electricity (Southern California Edison)	300 N Pepper Ave, Building "B" Rialto, CA 92376	Newport Rd / Southbound On-ramp	40
Fiber Optic Cable (American Telegraph & Telephone Transcontinental)	22311 Brookhurst St Huntington Beach, CA 92646	Newport Rd	20
2" Television Appurtenances (Time Warner Cable)	560 S. Promenade Ave, Suite 102 Corona, CA 92879	Newport Rd	10
Overhead Television (Mediacom)	2300 N Apache Trail Apache Junction, AZ 85119	Newport Rd / Southbound On-ramp	15
Fiber Optic (Sunesys)	1325 Pico, Suite 106 Corona, CA 92881	Newport Rd	10

6 CONTROL OF MATERIALS

Add to section 6-2.03:

The Department furnishes you with:

- Laminated wood box posts with metal caps for roadside signs
- Disks for survey monuments
- Concrete barrier markers
- Loop detector sensor units
- Model 2070 and 170 controller assembly, including controller unit, completely wired controller cabinet, and detector sensor units
- Modems
- Components of battery backup system as follows:
 - Inverter/charger unit
 - Power transfer relay
 - Manually-operated bypass switch

Battery harness
Utility interconnect wires
Battery temperature probe
Relay contact wires

- Padlocks
- COZEEP Contract

The Department furnishes you with completely wired controller cabinets with auxiliary equipment but without controller unit at 175 West Cluster Street, San Bernardino, CA 92408. At least 48 hours before you pick up the materials, inform the Engineer of what you will pick up and when you will pick it up.

You must furnish replacement plants. The Department does not pay you for the replacement plants.

Payment for transport and installation of these items is included in the related bid items and no additional compensation will be allowed therefor.

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8 PROSECUTION AND PROGRESS

Replace "Reserved" in section 8-1.04C with:

Section 8-1.04B does not apply.

Start job site activities within 55 days after receiving notice that the Contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department.

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

1. CPM baseline schedule
2. WPCP or SWPPP, whichever applies
3. Notification of DRA or DRB nominee and disclosure statement
4. Contingency plan for opening closures to public traffic
5. Traffic Control Plan

You may enter the job site only to measure controlling field dimensions and locate 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* form.
2. Written statement from the vendor that the order for the sign panels has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
3. Written statement from the vendor that the order for electrical material has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
4. Written statement from the vendor that the order for structural steel has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.

You may start job site activities before the 55th day after Contract approval if you:

1. Obtain specified authorization or acceptance for each submittal before the 55th day
2. Receive authorization to start

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

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9 PAYMENT

Add to section 9-1.16C:

The following items are eligible for progress payment even if they are not incorporated into the work:

1. Prestressing Steel for Cast-in-Place Members
2. Reinforcement
3. Irrigation Controller Enclosure Cabinets
4. Culvert Pipe
5. Irrigation Controllers
6. Rock Slope Protection Fabric
7. Miscellaneous Iron and Steel
8. Fences and Gates
9. Railings
10. Lighting Fixtures
11. Pavement Markers
12. Signal and Lighting Standards
13. Luminaires
14. Corrugated Steel Pipe Conduit
15. Metal Sign Structures (including Contractor Furnished Sign Panels)
16. Piling (except CIDH Piling)
17. Miscellaneous Drainage Facilities
18. Earth Retaining System
19. Miscellaneous Bridge Metal
20. Overside Drains and Appurtenances
21. Type B Joint Seal and Joint Seal Assemblies
22. Prestressing Steel for Post-Tension Member including Anchor Plates and Ducts
23. Precast Concrete Member
24. Pipe (Irrigation Systems)
25. Signal Cabinets
26. Signal Heads and Mounting Brackets
27. Structural Plate Installations
28. Camera Assemblies
29. Twisted Pair Cables
30. Ground Anchors

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DIVISION II GENERAL CONSTRUCTION

10 GENERAL

Add to section 10-1.02:

Do not place the uppermost layer of new pavement until all underlying conduits and loop detectors are installed.

Before starting the traffic signal functional test at any location, all items of work related to signal control must be completed and all roadside signs, pavement delineation, and pavement markings must be in place at that location.

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12 TEMPORARY TRAFFIC CONTROL

Replace section 12-2 with:

12-2 CONSTRUCTION PROJECT FUNDING SIGNS

12-2.01 GENERAL

Section 12-2 includes specifications for installing construction project funding signs.

Construction project funding signs must comply with the details shown on the Department's Traffic Operations Web site.

Keep construction project funding signs clean and in good repair at all times.

12-2.02 MATERIALS

Construction project funding signs must be wood post signs complying with section 56-4.

Sign panels for construction project funding signs must be framed, single sheet aluminum panels complying with section 56-2.

The background on construction project funding signs must be Type II retroreflective sheeting on the Authorized Material List for signing and delineation materials.

The legend must be retroreflective, except for nonreflective black letters and numerals. The colors blue and orange must comply with PR Color no. 3 and no. 6, respectively, as specified in the Federal Highway Administration's *Color Tolerance Chart*.

The legend for the type of project on construction project funding signs must read as follows:

HIGHWAY CONSTRUCTION

The legend for the types of funding on construction project funding signs must read as follows and in the following order:

FEDERAL HIGHWAY TRUST FUNDS

LOCAL FUNDS

The Engineer will provide the year of completion for the legend on construction project funding signs. Furnish and install a sign overlay for the year of completion within 10 working days of notification.

The legend for the year of completion on construction project funding signs must read as follows:

YEAR OF COMPLETION 2016

The size of the legend on construction project funding signs must be as described. Do not add any additional information unless authorized.

12-2.03 CONSTRUCTION

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

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

12-2.04 PAYMENT

Not Used

Replace section 12-3.13 with:

12-3.13 IMPACT ATTENUATOR VEHICLE

12-3.13A General

12-3.13A(1) Summary

Section 12-3.13 includes specifications for protecting traffic and workers with an impact attenuator vehicle during moving lane closures and when placing and removing components of stationary lane closures, ramp closures, shoulder closures, or a combination.

Do not use an impact attenuator vehicle to place, remove, or place and remove components of a stationary traffic control system on 2-lane, 2-way highway where the useable shoulder width is less than 10 feet.

Impact attenuator vehicles must comply with the following test levels under National Cooperative Highway Research Program 350:

1. Test level 3 if the preconstruction posted speed limit is 50 mph or more
2. Test levels 2 or 3 if the preconstruction posted speed limit is 45 mph or less

Comply with the attenuator manufacturer's instructions for:

1. Support truck
2. Trailer-mounted operation
3. Truck-mounted operation

Flashing arrow signs must comply with section 12-3.03. You may use a portable changeable message sign instead of a flashing arrow sign. If a portable changeable message sign is used as a flashing arrow sign, it must comply with section 6F.56 "Arrow Panels" of the *California MUTCD*.

12-3.13A(2) Definitions

impact attenuator vehicle: A support truck that is towing a deployed attenuator mounted to a trailer or a support truck with a deployed attenuator that is mounted to the support truck.

12-3.13A(3) Submittals

Upon request, submit a certificate of compliance for each attenuator used on the project.

12-3.13A(4) Quality Control and Assurance

Do not start impact attenuator vehicle activities until authorized.

Before starting impact attenuator vehicle activities, conduct a preinstallation meeting with the Engineer, subcontractors, and other parties involved with traffic control to discuss the operation of the impact attenuator vehicle during moving lane closures and when placing and removing components of stationary traffic control systems.

Schedule the location, time, and date for the preinstallation meeting with all participants. Furnish the facility for the preinstallation meeting within 5 miles of the job site or at another location if authorized.

12-3.13B Materials

Attenuators must be a brand on the Authorized Material List for highway safety features.

The combined weight of the support truck and the attenuator must be at least 19,800 pounds, except the weight of the support truck must not be less than 16,100 or greater than 26,400 pounds.

For the Trinity MPS-350 truck-mounted attenuator, the support truck must not have a fuel tank mounted underneath within 10'-6" of the rear of the support truck.

Each impact attenuator vehicle must have:

1. Legal brake lights, taillights, sidelights, and turn signals
2. Inverted "V" chevron pattern placed across the entire rear of the attenuator composed of alternating 4-inch wide nonreflective black stripes and 4-inch wide yellow retroreflective stripes sloping at 45 degrees

3. Type II flashing arrow sign
4. Flashing or rotating amber light
5. Operable 2-way communication system for maintaining contact with workers

12-3.13C Construction

Except where prohibited, use an impact attenuator vehicle:

1. To follow behind equipment and workers who are placing and removing components of a stationary lane closure, ramp closure, shoulder closure, or any combination. Operate the flashing arrow sign in the arrow or caution mode during this activity, whichever applies. Follow at a distance that prevents intrusion into the workspace from passing traffic.
2. As a shadow vehicle in a moving lane closure.

After placing components of a stationary traffic control system you may place the impact attenuator vehicle in advance of the work area or at another authorized location to protect traffic and workers.

Secure objects, including equipment, tools, and ballast on impact attenuator vehicles to prevent loosening upon impact by an errant vehicle.

Do not use a damaged attenuator in the work. Replace any attenuator damaged from an impact during work activities at your expense.

12-3.13 Payment

Not Used

Replace section 12-3.14 with:

12-3.14 TEMPORARY TRAFFIC SCREEN

12-3.14A General

Section 12-3.14 includes specifications for constructing temporary traffic screen at the locations shown.

12-3.14B Materials

Temporary traffic screen panels must be new or used, CDX grade or better, plywood or weather-resistant strandboard mounted and anchored on Type K temporary railing.

Wale boards must be new or used Douglas fir, rough sawn, construction grade or better.

Pipe screen supports must be new or used schedule 40, galvanized steel pipe.

Nuts, bolts, and washers must be cadmium plated.

Screws must be black or cadmium-plated flat head, cross-slotted screws with full thread length.

12-3.14C Construction

Mount and anchor temporary traffic screen on top of Type K temporary railing.

Remove the traffic screen from the highway when the Engineer determines it is no longer required. The traffic screen that is removed becomes your property.

A lateral move of Type K temporary railing with attached temporary traffic screen is change order work if ordered and the repositioning is not shown.

12-3.14D Payment

Temporary traffic screen is measured along the line of the completed screen.

Replace section 12-3.16 with:

12-3.16 TEMPORARY SIGNAL SYSTEM

12-3.16A General

Installing temporary signal system (TSS) consists of installing and maintaining temporary traffic signal, lighting, and flashing beacons for traffic control.

The Department will furnish 1 Model 170E traffic signal controller assembly, including wired cabinet, controller unit, and loop detector sensor units.

Furnish other materials and equipment for a TSS, including flashing beacons, signal heads, mast arms, luminaires, wood poles, conductors, and hardware.

Material and equipment used in the TSS may be new or used but must be suitable for the intended use.

Orient each signal face to be clearly visible to traffic approaching from the direction that the signal is intended to control.

12-3.16B Operation

TSS must operate at nominal 120 V(ac). Lighting must operate at 120 V(ac) or 240 V(ac).

Unless otherwise directed, the system must operate on a continuous, 24-hour basis except when it is necessary that traffic be controlled by flaggers.

The Department will perform timing for the TSS.

12-3.16C Maintaining Temporary Signal System

Except for the controller assembly, you are responsible for maintaining the TSS.

If components in the TSS are damaged, displaced, or cease to operate or function as specified from any cause during the progress of the work, immediately repair or replace the components, then restore to the original condition. Components include signs, generator, flashing beacons, and signal equipment.

If the TSS is out of operation, provide flaggers, at your expense, to maintain traffic control until the traffic signals are returned to service.

12-3.16D Conduit

At locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the trenching in pavement method as specified in section 86-2.05C.

12-3.16E Conductors and Wiring

Conductors must be the types specified in section 86-2.08 or Type UF cable of the size and number of conductors shown. The minimum conductor size must be no. 12.

If conductors are placed across paved areas, placement must comply with one of the following:

1. Place in a conduit
2. Suspend at least 25 feet above the roadway

Conductors placed outside of paved areas must be placed by one of the following methods:

1. Direct burial method with Type UF cable installed at a minimum depth of 24 inches below grade.
2. Placed in conduit. If Type 1 or 2 conduit is used, the minimum depth must be 12 inches. If Type 3 conduit is used, the minimum depth must be 18 inches.
3. Suspended from wood poles with a minimum clearance of 25 feet from grade at any point. Place the portions of the conductor installed on the face of wood poles in either Type 3 or Type 4 conduit.

Conductors placed across structures must be placed in a Type 1, 2, or 3 conduit. Install the conduit on the outside face of the railing and secure by a method determined by the Engineer.

Conductors to a terminal compartment or signal head on a pole may be spliced to through conductors of the same phase in a pull box adjacent to the pole. Do not splice conductors or cables except in pull boxes or in NEMA Type 3R enclosures.

12-3.16F Bonding and Grounding

Comply with section 86-2.10.

12-3.16G Service

12-3.16G(1) General

Use one of the following methods to provide power for the TSS:

1. Commercial power from an existing utility company

12-3.16G(2) Commercial Power

Commercial power must be 120 V(ac) or 120/240 V(ac). Protect the power source in a locked enclosure. Provide keys to all locks.

Do not use power from private parties.

Do not use electrical power from existing highway facilities unless authorized.

Make the arrangements with the utility company for providing service.

Commercial electrical power is available at the job site.

12-3.16H Department-Furnished Controller Assembly

Construct the controller cabinet foundation as shown for Model 332L, 334L, or 336L cabinets, including furnishing and installing anchor bolts. Install the controller cabinet on the foundation and make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations in each Department-furnished controller cabinet will be furnished to you at the job site.

The Department or local forces will maintain all controller assemblies.

12-3.16I Detectors

Loop detector sensor units are Department-furnished as part of the controller assembly.

Loop detector lead-in cable must be Type B.

Comply with section 86-5.01A.

12-3.16J Completion and Restoration

Backfill pole holes.

The following materials may be abandoned in place when no longer required:

1. Conductors placed in slots across paved areas
2. Direct buried cables, installed 24 inches or more below the ground surface

Add to section 12-4.02A:

If work including installing, maintaining, and removing Type K temporary railing is to be performed within 6 feet of the adjacent traffic lane, close the adjacent traffic lane.

Except as listed above, closure of the adjacent traffic lane is not required for installing, maintaining, and removing traffic control devices.

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

Designated holidays are shown in the following table:

Designated Holidays

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

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

Special days are: Martin Luther King Jr. Day, Cesar Chavez Day, Good Friday through Easter Sunday, Day after Thanksgiving, December 26th through January 2nd.

For a one-way reversing traffic-control lane closure, traffic may be stopped in 1 direction for periods not to exceed 15 minutes. After each stoppage, all accumulated traffic for that direction must pass through the work zone before another stoppage is made.

The maximum length of a single stationary one-way reversing traffic-control lane closure is 2 miles between flaggers.

The maximum length of the work area inside a lane closure other than one-way reversing traffic-control lane closure is 2 miles. Work area is as shown.

Not more than 1 stationary lane closure will be allowed in each direction of travel at one time. Concurrent stationary closures in the same direction of travel must be spaced no closer than 1.25 miles apart. Closures in the same direction of travel on alternating inside lane/outside lanes must be spaced by an additional 1.25 miles.

Freeway closure charts are for the erection and removal of falsework, placement and removal of overhead sign structures, bridge demolition, and other authorized work.

During blasting, hauling, and slide removal excavation operations, the road may be closed and traffic stopped for periods not to exceed 0 hours 10 minutes. After 1 closure is made, all accumulated traffic must pass through the work zone before another closure is allowed.

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

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

I-215 Mainline
Newport Road Overcrossing
(Bridges No. 56-0646)

	Number	Width (feet)	Height (feet)
Vehicle openings	3 (NB) 3 (SB)	49	15
Pedestrian openings	N/A	N/A	N/A
	Location	Spacing	
Falsework pavement lighting	R and L	30'	

NOTE:

R = Right side of traffic

L = Left side of traffic

C = Centered overhead

I-215 Northbound Loop On-Ramp
Newport Road Overcrossing
(Bridges No. 56-0646)

	Number	Width (feet)	Height (feet)
Vehicle openings	1	25	15
Pedestrian openings	N/A	N/A	N/A
	Location	Spacing	
Falsework pavement lighting	R	30'	

NOTE:

R = Right side of traffic

L = Left side of traffic

C = Centered overhead

I-215 Southbound Loop On-Ramp
Newport Road Overcrossing
(Bridges No. 56-0646)

	Number	Width (feet)	Height (feet)
Vehicle openings	1	25	15
Pedestrian openings	N/A	N/A	N/A
	Location	Spacing	
Falsework pavement lighting	R	30'	

NOTE:

R = Right side of traffic

L = Left side of traffic

C = Centered overhead

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

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

Add to the RSS for section 12-4.03B:

For each 10-minute interval or fraction thereof past the time specified to open the closure, the Department deducts the amount for liquidated damages per interval shown in the table below. Liquidated damages are limited to 5 percent of the total bid per occurrence. Liquidated damages are not assessed if the Engineer orders the closure to remain in place beyond the scheduled pickup time.

Type of facility	Route	Direction or Segment	Period	Liquidated damages/interval (\$)
Mainline	215	NB PM R17.8- R19.2	1st half hour 2nd half hour 2nd hour and beyond	\$1000 / 10 minutes \$1450 / 10 minutes \$1934 / 10 minutes
Mainline	215	SB PM R17.8- R19.2	1st half hour 2nd half hour 2nd hour and beyond	\$1649 / 10 minutes \$2474 / 10 minutes \$3299 / 10 minutes
Mainline (Full Closure)	215	NB PM R17.8- R19.2	1st half hour 2nd half hour 2nd hour and beyond	\$1422 / 10 minutes \$2133 / 10 minutes \$2845 / 10 minutes
Mainline (Full Closure)	215	SB PM R17.8- R19.2	1st half hour 2nd half hour 2nd hour and beyond	\$2105 / 10 minutes \$3157 / 10 minutes \$4310 / 10 minutes

Add to the RSS for section 12-4.03C:

Submit a contingency plan for each of the following activities:

1. Cold planing HMA for depths of 2 inches or greater
2. HMA paving
3. Asphalt or concrete grinding
4. Bridge work
5. Placement of bar reinforcing steel or structural members
6. Falsework erection or removal, including adjustments
7. Bridge demolition
8. Striping

Discuss the contingency plan with the Engineer at least 5 business days before starting the activity.

Replace "Reserved" in section 12-4.04 with:

Lane Closure Restriction for Designated Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	H xx	xx	xx							
	SD xx									
x	xx	H xx	xx							
		SD xx								
	x	xx	H xx	xx						
			SD xx							
	x	xx	xx	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx					
				x	SD xx					
					x	H xx				
						SD xx				
						x	H xx	xx	xx	xx
							SD xx			

Legend:	
	Refer to lane requirement charts
x	The full width of the traveled way must be open for use by traffic after 5 AM.
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 6 PM.
H	Designated holiday
SD	Special day

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

Chart no. 1 EA#:0J440 Freeway/Expressway Lane Requirements																									
County: Riverside							Route/Direction: 215/NB							PM: PM R17.8/R19.2											
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	1	1	1	1	1	1																		1	1
Fri	1	1	1	1	1	1																		1	1
Sat	1	1	1	1	1	1	1																		1
Sun	1	1	1	1	1	1	1																		1

Legend:

1	Provide at least 1 through freeway lane open in direction of travel
	Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Date: 5/22/2013

Developed by:D.M

Validity: 18 Months

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

Chart no. 2 EA#:0J440 Freeway/Expressway Lane Requirements																									
County: Riverside							Route/Direction: 215/SB							PM: PM R17.8/R19.2											
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	1	1	1	1	1																	1	1	1	1
Fri	1	1	1	1	1																		1	1	1
Sat	1	1	1	1	1	1	1																		1
Sun	1	1	1	1	1	1	1																		1

Legend:

1	Provide at least 1 through freeway lane open in direction of travel
	Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Date: 5/22/2013

Developed by:D.M

Validity: 18 Months

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

Chart no. 3 EA#:0J440 Complete Freeway/Expressway Closure Hours																										
County: Riverside										Route/Direction: 215/NB										PM: R17.8/R19.2						
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	C	C	C	C	C																				C	C
Fri	C	C	C	C	C																				C	C
Sat	C	C	C	C	C	C																				
Sun																									C	C
Legend: <input type="checkbox"/> C Freeway or expressway may be closed completely <input type="checkbox"/> No complete freeway or expressway closure is allowed																										
REMARKS: A total of 30 nights of full closure shall take place for bridge demolition, false work placement and removal.																										

Date: 8/20/2013

Developed by: ct

Validity: 18 months

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

Chart no. 4 EA#:0J440 Complete Freeway/Expressway Closure Hours																										
County: Riverside							Route/Direction: 215/SB							PM: R17.8/R19.2												
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	C	C	C	C																					C	C
Fri	C	C	C	C																						C
Sat	C	C	C	C	C																					C
Sun	C	C	C	C	C	C																			C	C

Legend:

C Freeway or expressway may be closed completely

No complete freeway or expressway closure is allowed

REMARKS: A total of 30 nights of full closure shall take place for bridge demolition, false work placement and removal.

Date: 8/20/2013

Developed by: ct

Validity: 18 months

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

Chart no. 5 EA#: 0J440 Complete Ramp Closure Hours																									
County: Riverside							Route/Direction: 215/NB Off-ramp							PM: 18.28											
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	C	C	C	C	C	C																		C	C
Fri	C	C	C	C	C	C																		C	C
Sat	C	C	C	C	C	C	C																		C
Sun	C	C	C	C	C	C	C																		C

Legend:
 C Ramp may be closed completely
 Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Date: 5/22/2013

Developed by: D.M

Validity: 18 Months

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

Chart no. 6 EA#: 0J440 Complete Ramp Closure Hours																									
County: Riverside							Route/Direction: 215/NB On-ramp							PM: 18.701											
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	C	C	C	C	C	C																		C	C
Fri	C	C	C	C	C	C																		C	C
Sat	C	C	C	C	C	C	C																		C
Sun	C	C	C	C	C	C	C																		C

Legend:
 C Ramp may be closed completely
 Work allowed within the highway where shoulder or lane closure is not required

REMARKS:

Date: 5/22/2013

Developed by: D.M

Validity: 18 Months

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

Chart no. 7 EA#: 0J440 Complete Ramp Closure Hours																									
County: Riverside						Route/Direction: 215/SB Off-ramp						PM: 18.748													
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	C	C	C	C	C																	C	C	C	C
Fri	C	C	C	C	C																		C	C	C
Sat	C	C	C	C	C	C	C																		C
Sun	C	C	C	C	C	C	C																		C
Legend: <input type="checkbox"/> C Ramp may be closed completely <input type="checkbox"/> Work allowed within the highway where shoulder or lane closure is not required																									
REMARKS:																									

Date: 5/22/2013

Developed by: D.M

Validity: 18 Months

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

Chart no. 8 EA#: 0J440 Complete Ramp Closure Hours																									
County: Riverside										Route/Direction: 215/SB On-ramp										PM: 18.296					
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	C	C	C	C	C																	C	C	C	C
Fri	C	C	C	C	C																		C	C	C
Sat	C	C	C	C	C	C	C																		C
Sun	C	C	C	C	C	C	C																		C
Legend: <input type="checkbox"/> C Ramp may be closed completely <input type="checkbox"/> Work allowed within the highway where shoulder or lane closure is not required																									
REMARKS:																									

Date: 8/20/2013

Developed by: CT

Validity: 18 Months

Replace section 12-4.05H with:

12-4.05H City Street Closures

Chart no. 9 City Street Requirements and Hours of Work																									
Location: Newport Road												Direction: EB/WB													
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		1	1	1	1	1																1	1	1	1
Fri		1	1	1	1	1																	1	1	1
Sat		1	1	1	1	1	1	1																	1
Sun		1	1	1	1	1	1	1																	1

Legend:

1 Provide at least 1 city street lane open in direction of travel

N No work allowed

REMARKS: The number of through traffic lanes in each direction of travel is 1.

Chart no. 10 Complete City Street Closure Hours																										
Location: Newport Road												Direction: EB/WB														
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	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	C	C	C	C
Fri		C	C	C	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	C	C	C	
Sat		C	C	C	C	C	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	C
Sun		C	C	C	C	C	C	C	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	C

Legend:

1 Provide at least 1 city street lane open in direction of travel

C Street may be closed

N No work allowed

REMARKS: The number of through traffic lanes in each direction of travel is 1.

Replace section 12-5 with:

12-5 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

12-5.01 GENERAL

Section 12-5 includes specifications for closing traffic lanes, ramps, or a combination, with stationary lane closures on multilane highways. The traffic control system for a lane closure or a ramp closure must comply with the details shown.

Traffic control system includes signs.

12-5.02 MATERIALS

Not Used

12-5.03 CONSTRUCTION

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

For multilane freeway or expressway lane closures, do not place the 2L tangent section shown along lane lines between the lane closure tapers.

Whenever components of the traffic control system are displaced or cease to operate or function as specified from any cause, immediately repair the components to the original condition or replace the components and restore the components to the original location.

For a stationary lane closure, ramp closure, or a combination, made only for the work period, remove the components of the traffic control system from the traveled way and shoulder, except for portable delineators placed along open trenches or excavation adjacent to the traveled way at the end of each work period. You may store the components at selected central locations designated by the Engineer within the limits of the highway.

12-5.04 PAYMENT

Traffic control system for lane closure is paid for as traffic control system.

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

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

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

13 WATER POLLUTION CONTROL

Add to section 13-1.01A:

The following RWQCBs will review the authorized SWPPP:

1. Santa Ana

Add to section 13-3.01A:

The project is risk level 1.

Replace 1st paragraph of section 13-6.03C with:

Provide temporary drainage inlet protection around drainage inlets as changing conditions require. Drainage inlet protection must be Type 3B, Type 5, Type 6A, or Type 6B, as appropriate for conditions around the drainage inlet.

Add to section 13:

13-11 TEMPORARY CLEAR WATER DIVERSION SYSTEM

13-11.01 GENERAL

13-11.01A Summary

Section 13-11 includes specifications for constructing, maintaining, reconstructing, and later removing temporary clear water diversion systems.

13-11.01B Submittals

13-11.01B(1) Temporary Clear Water Diversion System Plan

Temporary Clear Water Diversion System Plan (TCWDSP) must include:

1. Installation and removal process, including equipment, platforms for equipment, and access locations
2. Anticipated flow rates
3. Calculations showing the basis of the sizing of cofferdams, piping or other conveyance materials used in the TCWDSP, with the resulting analysis providing assurance that the work area to be protected by the TCWDSP will remain dry during the duration of the work
4. Plans showing location(s) of diversion, including layouts, cross sections, and elevations
5. Materials proposed for use, including MSDS
6. Operation and TCWDSP maintenance procedures
7. Restoration plans showing before and after conditions, including photos of existing conditions for areas disturbed during the installation, operation, and removal of the temporary clear water diversion system
8. Monitoring and reporting plan to ensure applicable water quality objectives are met
9. Schedule of work, including BMP implementation
10. Pumping system, if used.
11. Fish passage plan, if applicable.

All submittals which include plans and calculations must be sealed by a licensed California Civil Engineer.

At least 55 days before temporary clear water diversion system work in the creek:

1. Submit 3 copies of your TCWDSP for review. Allow 5 days for the Department's review. The Engineer provides comments and specifies the date when the review stopped if revisions are required.
2. Change and resubmit a revised TCWDSP within 5 days of receiving the Engineer's comments. The Department's review resumes when a complete TCWDSP is resubmitted. Allow 5 days for the Department's second review. Note that the Engineer's comments may include the regulatory agencies' comments.
3. If additional comments are provided by the Engineer, change and resubmit a revised TCWDSP within 5 days of receiving the Engineer's comments.
4. When the Engineer authorizes the TCWDSP, submit an electronic copy and 4 printed copies of the authorized TCWDSP.

13-11.02 MATERIALS

13-11.02A Gravel

Gravel must:

1. Be river run gravel obtained from a river or creek bed with gradation of 100% passing a 3/4 inch sieve and 0% passing a 3/8 inch sieve
2. Be clean, hard, sound, durable, uniform in quality, and free of any detrimental quantity of soft, thin, elongated or laminated pieces, disintegrated material, organic matter, or other deleterious substances
3. Be composed entirely of particles that have no more than one fractured face
4. Have a cleanliness value of at least 85, as determined by the Cleanliness Value Test Method for California Test No. 227

13-11.02B Impermeable Plastic Membrane

Impermeable plastic membrane must be:

1. Single ply, commercial quality, polyethylene with a minimum thickness of 10 mils complying with ASTM D 2103
2. Free of holes, punctures, tears or other defects that compromise the impermeability of the material
3. Suitable for use as a impermeable membrane
4. Resistant to UV, retaining a minimum grab breaking load of 70% after 500 hours under ASTM D 4355.

13-11.02C Gravel-filled Bags

Gravel-filled bags must comply with section 13-5.02G.

The 2nd paragraph of section 13-5.02G does not apply.

13-11.02D Plastic Pipes

Plastic pipe, elbows, and risers must comply with section 64-1.02 and:

1. Be clean, uncoated, in good condition free of rust, paint oil dirt or other residues that could potentially contribute to water pollution
2. Be adequately supported for planned loads
3. Use watertight joints
4. Be made of a material or combination of materials that are suitable for clean water and which do not contain banned, hazardous or unlawful substances

13-11.02E Rock

Rock must comply with Rock Grading for 7-inch-Thick Layer under section 72-4.02.

13-11.03 CONSTRUCTION

13-11.03A General

Construction, use and removal of the temporary clear water diversion system is restricted to the time period from May 15 to October 15. If the work in the creek extends beyond October 15, remove temporary clear water diversion system, restore the creek to original flow condition, and reconstruct the temporary clear water diversion system after May 15 of the following year.

Do not use motorized vehicles and equipment in areas of flowing and standing water for the construction or removal of the temporary creek diversion system. Comply with section 13-4.03.

Remove vegetation to ground level and clear away debris.

Place temporary or permanent fill as allowed by PLACs.

Place rock at outlet of diversion pipe. Comply with section 72-4.03 except motorized vehicles and equipment must not be used in areas of flowing and standing water.

Do not construct or reconstruct diversion system if the 72-hour forecasts predict a 50% or greater chance of rain in the project area.

Stop all work and remove all material and equipment from the creek between upstream and downstream cofferdams if the 72-hour forecasts predict a 50% or greater chance of rain in the project area and the predicted rainfall is to be estimated to produce a flow volume exceeding the design capacity of the TCDS.

The temporary clear water diversion system must be constructed within the temporary impact footprint allowed by the PLAC in the Water Quality Information Handout.

Lap and join all joints between the edges of impermeable plastic membrane with commercial quality waterproof tape with minimum 4-inch lapping at the edges.

Seal all opening or penetrations through the impermeable plastic membrane with commercial quality waterproof tape.

13-11.03B Maintenance

Prevent leaks in the temporary clear water diversion system.

Repair holes, rips and voids in the impermeable plastic membrane with commercial quality waterproof tape. Replace impermeable plastic membrane when patches or repairs compromise the impermeability of the material.

Repair temporary clear water diversion system within 24 hours after the damage occurs.

Prevent debris from entering the creek.

Remove and replace immediately gravel, gravel-filled bags, impermeable plastic membrane, or plastic pipes contaminated by construction activities.

Remove sediment deposits and debris from temporary clear water diversion system as needed. If removed sediment is deposited within project limits, it must be stabilized and not subject to erosion by wind or water.

13-11.03C Removal

When no longer required, remove and dispose of all components of temporary clear water diversion system. Return the creek bed and banks to the original condition.

Do not excavate the native creek material. Backfill ground disturbance, including holes and depressions caused by the installation and removal of the temporary clear water diversion system with gravel. Maintain the original line and grade of the creek bed.

13-11.04 PAYMENT

Not Used

Add to Section 13:

13-12 TEMPORARY STREAM CROSSING

13-12.01 GENERAL

Section 13-12 includes specifications for temporary stream crossings.

13-12.02 MATERIALS

Gravel must:

1. Be clean, prewashed, angular, crushed rock,
2. Be washed at least once and have a cleanness value of 85 or higher verified by California Test No. 227,
3. Be free of oils or other petroleum based material, clay, debris, and other types of organic material, and
4. Meet the following grading:

Gravel Grading

Sieve sizes	Percentage passing
1 1/2"	75-100
1"	40-50
3/4"	25-35
1/2"	0-20

Note: percent by dry weight

Impermeable plastic sheet must comply with section 13-12.02C.

Filter fabric must be Class A and comply with section 88-1.02B.

Corrugated metal pipe must comply with section 66. Pipe must be adequately supported for planned loads.

13-12.03 CONSTRUCTION

Install impermeable plastic sheet with minimal seams. Where seams occur, lap and seal with commercial quality waterproof tape.

Place corrugated metal pipe and gravel on filter fabric within the stream channel. Remove sharp objects that could damage the fabric. Use methods for placing gravel that will not damage the stream channel, fabric, plastic sheet, or pipe. Spread gravel evenly to a depth of 6 inches on the bottom of the stream channel, and place gravel to a depth of 2 feet on the sides of the stream channel and on top of the pipe.

Repair damaged fabric by placing new fabric over area. The new fabric must be large enough to cover the damaged area and provide at least an 18 inch overlap on all edges.

Repair holes, rips, and voids in the impermeable plastic sheet by taping or replacing the impermeable plastic sheet.

Repair or replace temporary stream crossing damages on the same day when damage occurs.

Prevent leaks in the temporary stream crossing.

Backfill and repair of ground disturbance caused by the installation and removal of temporary stream crossing must comply with section 5-1.36.

Remove and dispose of temporary stream crossing materials when the Engineer determines that the temporary stream crossing is no longer required.

The Department does not pay the additional cost of relocating temporary stream crossings during the course of work.

13-12.04 PAYMENT

Not used

14 ENVIRONMENTAL STEWARDSHIP

Add to section 14-1.02A:

An ESA exists on this project.

Before start of work, protect the ESA by installing Temporary Fence (Type ESA).

Replace section 14-6.02 with:

14-6.02 SPECIES PROTECTION

14-6.02A General

Section 14-6.02 includes specifications for protecting regulated species or their habitat.

This project is within or near habitat for regulated species shown in the following table:

Species Name
Burrowing Owl

The Department anticipates nesting or attempted nesting by migratory and nongame birds from March 1st to June 30th.

14-6.02B Material

Not Used

14-6.02C Construction

14-6.02C(1) General

Not Used

14-6.02C(2) Protective Radius

Upon discovery of a regulated species, stop construction activities within a 100-foot radius of the discovery. Immediately notify the Engineer. Do not resume activities until receiving notification from the Engineer.

14-6.02C(3) Protocols

Reserved

14-6.02C(4) Biological Resource Information

Reserved

14-6.02C(5) Protection Measures

Within species protection area 1, implement the following protection measures:

1. Prior to ground disturbing activities, a qualified biologist will conduct and submit a pre-construction survey report within 30 days of project initiation.

14-6.02C(6) Monitoring Schedule

Reserved

14-6.02D Payment

Not Used

Replace section 14-6.06 with:

14-6.06 SPECIES PROTECTION AREA

14-6.06A General

14-6.06A(1) Summary

Section 14-6.06 includes specifications for areas that have species protection requirements.

Species protection areas (SPAs) within the project limits are shown:

Species Protection Areas

Identification	Location
SPA 1	Entire project limits

14-6.06B Materials

Not Used

14-6.06C Construction

Not Used

14-6.06D Payment

Not Used

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

Do not exceed 86 dBA LMax at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m

Add to section 14-8.02:

Provide one Type 1 sound level meter and 1 acoustic calibrator to be used by the Department until Contract acceptance. Provide training by a person trained in noise monitoring to 1 Department employee designated by the Engineer. The sound level meter must be calibrated and certified by the manufacturer or other independent acoustical laboratory before delivery to the Department. Provide annual recalibration by the manufacturer or other independent acoustical laboratory. The sound level meter must be capable of taking measurements using the A-weighting network and the slow response settings. The measurement microphone must be fitted with a windscreen. The Department returns the equipment to you at Contract acceptance. Work specified in this paragraph is paid for as noise monitoring.

Replace section 14-11.07 with:

14-11.07 REMOVE YELLOW TRAFFIC STRIPE AND PAVEMENT MARKING WITH HAZARDOUS WASTE RESIDUE

14-11.07A General

14-11.07A(1) Summary

Section 14-11.07 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.

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

14-11.07A(2) Submittals

14-11.07A(2)(a) General

Reserved

14-11.07A(2)(b) Lead Compliance Plan

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

14-11.07A(2)(c) Work Plan

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

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.

14-11.07A(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

14-11.07A(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.

14-11.07A(2)(f) Disposal Documentation

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

14-11.07B Materials

Not Used

14-11.07C 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 California Department of Public Health (CDPH) 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 60 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 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.

14-11.07D Payment

Payment for a lead compliance plan is not included in the payment for environmental stewardship work.

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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Replace "Reserved" in section 14-11.08 with:

14-11.08A General

Section 14-11.08 includes specifications relating to the disturbance of existing paint systems.

The existing paint system on bridge number 56-0646R/L and 56-0647R contains lead. Any work that disturbs the existing paint system exposes workers to health hazards and produces:

1. Debris containing heavy metal in amounts that exceed the thresholds established in 8 CA Code of Regs and 22 CA Code of Regs. This debris is a Department-generated hazardous waste.
2. Toxic fumes when heated.

Grime and detritus already on the bridge before the start of work may also contain lead. Consider this grime and detritus part of the existing paint system. The Department is the hazardous waste generator if the Engineer accepts waste-characterization test results demonstrating that the debris is a hazardous waste.

Contain all debris produced when the existing paint system is disturbed. If containment measures are inadequate to contain and collect debris produced when the existing paint system is disturbed, stop the work and do not perform additional work until:

1. Revised debris containment and collection plan has been authorized
2. Released material has been collected and contained

Handle, store, transport, and dispose of debris produced when the existing paint system is disturbed under applicable federal, state, and local hazardous waste laws.

14-11.08B Submittals

14-11.08B(1) General

Not Used

14-11.08B(2) Debris Containment and Collection Plan

Submit a debris containment and collection plan. The plan must:

1. Identify materials, equipment, and methods to be used when the existing paint system is disturbed
2. Include shop drawings of:
 - 2.1. Containment systems complying with section 59-2.03B(3)
 - 2.2. Components that provide ventilation, air movement, and visibility for worker safety
3. Include the name and location of the analytical laboratory that will perform the analyses
4. Identify the hazardous waste transporter that will haul the debris and provide documentation of
 - 4.1 Current DTSC registration
 - 4.2 Compliance with the CA Highway Patrol Biennial Inspection of Terminals Program
5. Include the name and location of the disposal facility that will accept the hazardous waste

Allow 20 days for review.

If required, submit a revised debris containment and collection plan.

14-11.08B(3) Lead Compliance Plan

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

14-11.08B(4) Air Monitoring Reports

Not Used

14-11.08B(5) Soil Sampling Results for Debris Containment Verification

Not Used

14-11.08B(6) Waste-Characterization Test Results

Submit waste-characterization test results for the debris and chain of custody documentation before:

1. Requesting the Engineer's signature on the disposal facility's waste profile document
2. Requesting a generator's EPA Identification Number
3. Removing the debris from the site

14-11.08B(7) Request for U.S. Environmental Protection Agency Identification Number

Submit a request for the generator's EPA Identification Number when the Engineer accepts waste-characterization test results documenting that the debris is a hazardous waste.

14-11.08B(8) Disposal Documentation

Submit documentation from the receiving landfill or recycling facility confirming proper disposal within 5 business days of transporting debris from the project.

14-11.08C Safety and Health Provisions

14-11.08C(1) General

Comply with 8 CA Code of Regs, including § 1532.1.

14-11.08C(2) Protective Work Clothing and Washing Facilities

Supply clean protective work clothing for 5 Department personnel:

1. Whenever there is possible exposure to heavy metals or silica dust
2. During application of paint undercoats

Replace protective work clothing as needed.

Protective work clothing and washing facilities must be inspected and authorized for use by Department personnel before starting any activity with the potential for lead exposure.

Protective work clothing remains your property upon completion of the Contract.

14-11.08D Work Area Monitoring

14-11.08D(1) General

Not Used

14-11.08D(2) Air Monitoring

Not Used

14-11.08D(3) Soil Sampling for Debris Containment

In areas without exposed soil, the concentrations of heavy metals in the work area must not increase when the existing paint system is disturbed. Any visible increase in the concentrations of heavy metals must be removed.

14-11.08E Debris Management

14-11.08E(1) Debris Storage

Debris produced when the existing paint system is disturbed must not be temporarily stored on the ground. Before the end of each work shift, remove accumulated debris from the containment system. Store the debris as a hazardous waste.

14-11.08E(2) Debris Waste Characterization

Perform waste characterization testing on the debris as required by the disposal facility including:

1. Total lead by US EPA Method 6010B
2. Soluble lead by California Waste Extraction Test (CA WET)
3. Soluble lead by Toxicity Characteristic Leaching Procedure (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 job site to the analytical laboratory. The laboratory must be certified by the CDPH's Environmental Laboratory Accreditation Program (ELAP) for all analyses to be performed.

Before performing the analyses, the laboratory must homogenize each sample. The homogenization process must not include grinding of the samples. A sample aliquot must be:

1. Obtained in an amount large enough for all analyses to be performed
2. Homogenized a 2nd time
3. Used for the total and soluble analyses after the 2nd homogenization

14-11.08E(3) Debris Transport and Disposal

14-11.08E(3)(a) General

For bidding purposes, assume the debris is a hazardous waste.

14-11.08E(3)(b) Hazardous Waste Debris

After the Engineer accepts the waste-characterization test results, dispose of the debris:

1. Within 60 days after accumulating 220 lb of debris
2. At an appropriately permitted Class I facility located in California

Make all arrangements with the operator of the disposal facility.

If less than 220 lb of hazardous waste is generated in total, dispose of it within 30 days after the start of accumulation of the debris.

Use a hazardous waste manifest and a transporter using vehicles with current DTSC registration certificate when transporting hazardous waste. The Engineer provides the generator's EPA Identification Number and signs all manifests as the hazardous waste generator within 2 business days of accepting the waste-characterization test results and receiving your request for the generator's EPA Identification Number.

14-11.08E(3)(c) Nonhazardous Waste Debris

If waste characterization test results demonstrate that the debris is a nonhazardous waste and the Engineer accepts the results, dispose of the debris at an appropriately permitted CA Class II or CA Class III facility or recycle it. Make all arrangements with the operator of the disposal facility and comply with the facility's requirements.

You may dispose of nonhazardous debris at a facility equipped to recycle the debris if:

1. Copper slag abrasive blended by the supplier with a calcium silicate compound is used for blast cleaning.
2. You make all arrangements with the recycling facility's operator and perform any facility-required testing of the debris.

The Department does not adjust payment for disposal of nonhazardous debris at a recycling facility.

Replace section 14-11.09 with:

14-11.09 TREATED WOOD WASTE

14-11.09A General

14-11.09A(1) Summary

Section 14-11.09 includes specifications for handling, storing, transporting, and disposing of treated wood waste (TWW).

Wood removed from metal beam guard railing and roadside sign is TWW. Manage TWW under 22 CA Code of Regs, Div. 4.5, Chp. 34.

14-11.09A(2) Submittals

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

14-11.09B Materials

Not Used

14-11.09C Construction

14-11.09C(1) General

Not Used

14-11.09C(2) Training

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

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

Maintain records of personnel training for 3 years.

14-11.09C(3) Storage

Store TWW before disposal using the following methods:

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

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

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

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

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

14-11.09C(4) Transporting and Disposal

Before transporting TWW, obtain an agreement from the receiving facility that the TWW will be accepted. Protect shipments of TWW from loss and exposure to precipitation. For projects with 10,000 lb or more of TWW, request a generator's EPA Identification Number at least 5 business days before the 1st shipment. Each shipment must be accompanied by a shipping record such as a bill of lading or invoice that includes:

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

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

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

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

Dispose of TWW within:

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

15-2.02B(3)(c) Construction

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

Do not use a heating device to soften the pavement.

The cold planing machine must be:

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

Replace broken, missing, or worn machine teeth.

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

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

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

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

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

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

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

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

Completely remove temporary tapers before placing permanent surfacing.

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

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

15-2.02B(3)(d) Payment

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

Replace section 15-2.02C(2) with:

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

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

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

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

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

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

Replace section 15-2.01 with:

15-2.02I Remove Sign Structures

Removing overhead sign structures includes removal of:

1. Frames, braces, supports, and brackets
2. Portions of foundations
3. Sign panels
4. Mounting hardware for light fixtures
5. Walkways, safety railing, gutter
6. Electrical equipment for sign lighting
7. Hardware
8. Posts
9. Portions of foundations

Concrete foundations may be abandoned in place except that the top portion, including anchor bolts, reinforcing steel, and conduits, must be removed to a depth of not less than 2 feet below the adjacent finished grade. The resulting holes must be backfilled and compacted with material that is equivalent to the surrounding material.

Remove signs' conduit and wiring to the nearest pull box. Remove fuses within spliced connections in the pull box.

Add the following to section 15-2.03A(1):

Salvage the following:

1. Sign panels
2. Electrical equipment

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

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

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

1. Engineer
2. Recycle coordinator at telephone number (916) 859-7803

For District 8, the Department salvage storage location is:

State of California, Department of Transportation Maintenance Yard (MS 9)
175 West Cluster Street
San Bernardino, CA 92408
(909) 383-4427

Replace section 15-2.05C with:

15-2.05C Abandon Culverts and Pipelines

15-2.05C(1) General

Abandon culverts or pipelines by removing portions of the culverts or pipelines, filling the inside, and backfilling the depressions and trenches to grade. As an alternative to abandoning a culvert or pipeline, you may remove the culvert or pipeline, dispose of it, and backfill.

Notify the Engineer before abandoning a culvert or pipeline.

15-2.05C(2) Materials

Openings into existing structures that are to remain in place must be plugged with minor concrete under section 90.

15-2.05C(3) Construction

Wherever culverts or pipelines intersect side slopes, remove them to a depth of at least 3 feet. Measure the depth normal to the plane of the finished side slope. Abandon the remaining portion of the culvert or pipeline.

Culverts or pipelines that are 12 inches or more in diameter must be completely filled by authorized methods. Backfill with sand that is clean, free draining, and free from roots and other deleterious substances. As an alternative to sand, you may backfill with one of the following:

1. Controlled low-strength material under section 19-3.02F
2. Slurry cement backfill under section 19-3.02D

Ends of culverts and pipelines must be securely closed by a 6-inch-thick, tight-fitting plug or wall of commercial-quality concrete.

15-2.05C(4) Payment

If backfilling inside the culvert or pipeline is required, payment for backfilling inside the culverts or pipelines is included in the payment for abandon culvert or abandon pipeline. Payment for backfilling outside the culvert or pipeline is included in the payment for abandon culvert or abandon pipeline.

**DIVISION III GRADING
16 CLEARING AND GRUBBING**

Replace the 4th paragraph in section 16-1.03A with:

Clear and grub vegetation only within the excavation and embankment slope lines.

Replace section 16-1.03D with:

You may place vegetation in embankment areas. Comply with Section 19-6.

Place vegetation as specified for Method I or II below:

Method I:

1. Place vegetation outside of the 1:1 inclined plane sloping out and down from the outside edge of the shoulder of the planned roadbed. Do not place vegetation within 5 feet of the finished slope line measured normal to the slope.

2. Mix brush and debris with at least 50 percent earth. Place the mixture in uniform layers.
3. Do not use vegetation material where it will interfere with planned work.

Method II:

1. Place vegetation at least:
 - 1.1. 15 feet beneath the grading plane.
 - 1.2. 10 feet from the surface of any embankment slope.
 - 1.3. 6 feet horizontally from and not beneath any planned structure including abutments, walls, footings, foundations, piles, drainage structures, and utility installations.
2. Chip brush, grass, weeds, slash, and limbs or logs under 4 inches in diameter. Place chips on the completed embankment slopes and mix with the underlying earth so that the vegetation will not support combustion.

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19 EARTHWORK

Add to section 19-1.01B:

4. Large, hard boulders and rock material that cannot be excavated or broken down to a suitable size for removal and use at the job site.

Unsuitable material (rock) exists within embankments and underground throughout the job site. Unsuitable material consists of large, hard boulders that may be difficult to excavate, trench, drill or otherwise penetrate.

Add to section 19-1.03B:

Remove unsuitable material (rock) in whole pieces that cannot be broken down in place. Dispose of unsuitable material or incorporate it into appropriate planned uses.

Add to section 19-1.04:

Removal of unsuitable material (rock) as described, is paid for as the type of excavation involved.

Add to section 19-2.03G:

Roughen embankment slopes to receive erosion control materials by either track-walking or rolling with a sheepsfoot roller. Track-walk slopes by running track-mounted equipment perpendicular to slope contours.

Roughen excavation slopes and flat surfaces to receive erosion control materials by scarifying to a depth of 6 inches.

Add to section 19-3.01A(1):

Structure backfill includes constructing the geocomposite drain. Geocomposite drain must comply with section 68-7.

Replace item 3 in the list in the 9th paragraph of section 19-3.03K with:

3. Grout and shotcrete have cured for at least 72 hours or have attained a compressive strength of at least 3600 psi

Add to section 19-7.02C:

The portion of imported borrow placed within 4 feet of the grading plane must have a resistance (R-Value) of at least 35 for Newport Road and 40 for all other pavements.

Replace the 2nd and 3rd paragraphs of section 19-7.04 with:

Imported borrow is measured based on planned or authorized cross section for embankments as shown and the measured ground surface.

Quantities of roadway excavation, structure excavation, and ditch excavation used in constructing the embankment will be adjusted by multiplying by a grading factor. This grading factor is determined by the Engineer. The Department does not adjust payment if the grading factor determined by the Engineer does not equal the actual grading factor.

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20 LANDSCAPE

Add to section 20-1.02C of the RSS for section 20:

Select herbicides from the following table:

Herbicide name	Herbicides					
	Herbicide type					
	Preemergent (granular)	Preemergent (non-granular)	Post- emergent	Selective	Non- selective	Systemic
Aminopyralid				X		
Chlorsulfuron				X		
Clopyralid MEA					X	
Diquat dibromide					X	
Dithiopyr		X				
Fluazifop-P-Butyl				X		
Flumioxazin				X		
Glyphosate			X			X
Imazapyr					X	
Isoxaben		X				
Oryzalin		X				
Oxadiazon	X	X				X
Oxyfluorfen (odorless)		X	X			
Pendimethalin	X	X	X			
Prodiamine		X				
Rimsulfuron				X		
Sethoxydim			X	X		
Sulfentrazone					X	
Sulfometuron-methyl					X	
Sulfosulfuron					X	
Triclopyr						X

Add to section 20-1.03C(3) of the RSS for section 20:

Control weeds within the highway. In the median and surfaced areas such as new and existing pavement, curbs, and sidewalks, weeds do not need to be controlled.

In areas where plants are to be planted in groups or rows 15 feet or less apart, control weeds within the planting area and the area extending 6 feet beyond the outer limits of the groups or rows of plants with pesticides or by hand pulling.

Where the plants are to be planted more than 15 feet apart and are located outside of groundcover areas, control weeds with pesticides or by hand pulling within an area 6 feet in diameter centered at each plant location.

Control weeds under guard rails, from within asphalt concrete surfacing, concrete surfacing, rock blankets, gravel mulch or decomposed granite areas, and unpaved gore areas between the edge of pavement and planting areas with pesticides or by hand pulling.

Where pavement, dikes, curbs, sidewalks, walls, and fences are located 12 feet or more beyond mulched areas, plant basins, and groundcover areas, limit mowing to 6 feet beyond these areas.

Replace the 3rd paragraph of section 20-2.01A(4)(b)(i) of the RSS for section 20 with:

Supply lines on the discharge side of the valve must be tested in conformance with Method B only. Testing by Method A is not allowed.

Supply lines installed by trenching and backfilling and supply lines that are completely visible after installation must be tested by Method B.

Replace item 2 in the list in the 11th paragraph of section 20-2.01C(2) of the RSS for section 20 with:

2. Groundcover, replacement of groundcover that is removed or rototilled is not required.

Add to section 20-2.01C(2) of the RSS for section 20:

Apply 1 application of a preemergent pesticide to trenched areas in existing ground cover areas and to trenched areas adjacent to fences, curbs, dikes and shoulders. The Engineer determines when the preemergent pesticide must be applied.

Add to section 20-2.05B of the RSS for section 20:

You may use conductors that are not armor-clad if installed in a conduit.

Add to section 20-2.07B(2)(a) of the RSS for section 20:

Before the irrigation system functional test begins, furnish 1 remote access devices.

The irrigation controllers within Department highway areas must be Calsense Irrigation Controller (Model No. ET2000E) and must have 2-way communication by WiFi. The vendor must install any necessary software and conduct any initial software or proprietary website setup configuration for communications between controller and any web-enabled device.

Delete items 2.1, 2.2, and 2.3 in the list in the 1st paragraph of section 20-2.07B(3) of the RSS for section 20.

Replace the 4th paragraph of section 20-2.10B(4) of the RSS for section 20 with:

Pea gravel for filling the drainpipe must have a maximum diameter of 1/2 inch. Pea gravel must be naturally rounded aggregate, clean, washed, dry and free from clay or organic material.

Add to the list in 1st paragraph of section 20-2.11B(10)(a) of the RSS for section 20:

11. Be equipped with a self-flushing feature for recycled water. Valves must not have external tubing.

Replace "Reserved" in section 20-2.12 of the RSS for section 20 with:

Water meters for the irrigation systems will be installed by the local water authority. The local water authority is Eastern Municipal Water District.

The local water authority has established a fee of \$23,197 for furnishing and installing each water meter. The fees charged by the local water authority include:

1. Furnishing and installing each water meter
2. Connecting to the local water authority's main water line including hot tap or tee as required
3. Furnishing and installing extension pipe from main water line to the water meter

4. Sterilizing the extension pipe

Make arrangements and pay the fees required to install each water meter.

If, at the time of installation, this fee is changed, the Department makes a payment adjustment for the difference in cost. The adjustment is made on the progress payment after the meter is installed.

Submit a copy of the invoice for the fee.

Add to section 20-4.01A of the RSS for section 20:

The plant establishment period must be Type 2.

Add to section 20-4.03C of the RSS for section 20:

Apply slow-release fertilizer to the plants during the 1st week of April and September of each year.

Replace the table in the 1st paragraph of section 20-5.03B(2)(c) of the RSS for section 20 with:

Grading Requirements

Screen size (inches)	Percentage passing
12	100
8	50-85
6	0-50

21 EROSION CONTROL

Add to section 21-1.01B:

The certificate of compliance for weed-free straw must include the *Certificate of Quarantine Compliance*.

Add to section 21-1.02I:

Straw must be weed free. Weed-free straw must comply with the Department of Food and Agriculture's certification requirements for weed-free straw.

Replace "biodegradable jute, sisal, or coir fiber" in the 1st paragraph of the RSS for section 21-1.02P with:

photodegradable plastic

Add to section 21-1.02P:

Straw must be weed free. Weed-free straw must comply with the Department of Food and Agriculture's certification requirements for weed-free straw.

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DIVISION V SURFACINGS AND PAVEMENTS
39 HOT MIX ASPHALT

Add to section 39-1.01:

Produce and place HMA Type A under the Standard construction process.
Produce and place HMA Type C under the Standard construction process
Produce and place RHMA-G under the Standard construction process.

Add to section 39-1.02C:

Asphalt binder used in HMA Type A and Type C must be PG 64-28 PM.
Asphalt binder mixed with asphalt modifier and CRM for asphalt rubber binder must be PG 64-16.

Add to section 39-1.02E:

Aggregate used in HMA Type A must comply with the 3/8-inch HMA Types A and B gradation.
Aggregate for RHMA-G must comply with the 1/2 and 3/4-inch RHMA-G gradation.

Add to section 39-1.03B:

Determine the OBC for RHMA-G at 5.0 percent air voids under California Test 367. The OBC must be greater than or equal to 7.5 percent based on the total weight of mix.

Replace the 2nd, 3rd, and 4th paragraphs of section 39-1.11B(1) of the RSS for section 39-1.11 with:

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.

Delete section 39-1.11B(2) of the RSS for section 39-1.11.

Add to section 39-1.11D of the RSS for section 39-1.11:

Pave shoulders and median borders adjacent to the lane before opening a lane to traffic.
Place additional HMA along the pavement's edge to conform to road connections and driveways. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

Add to RSS section 39-1.11A:

A Material Transfer Vehicle (MTV) must be used when placing RHMA-G, HMA-C.

The MTV must:

1. Receive HMA directly from trucks without depositing the HMA on the roadway surface.
2. Transfer remixed HMA directly into the paver's receiving hopper or feed system.
3. Remix the HMA, with augers, before loading the paver.
4. Have sufficient capacity to prevent stopping the paver.

Replace the headings and paragraphs in section 39-1.12 with:

39-1.12A General

Section 39-1.12 includes specifications for measuring pavement smoothness with an inertial profiler (IP) and straightedge, analyzing the data with FHWA's engineering software ProVAL, and correcting deficient smoothness.

The RSS for sections 39-1.12 and 39-1.12C do not apply.

Test pavement smoothness using an IP except use a 12-foot straightedge at the following locations:

1. Traffic lanes less than 1,000 feet in length including ramps, turn lanes, and acceleration and deceleration lanes
2. HMA pavement within 3 feet from and parallel to the construction joint formed between curbs, gutters, or existing pavement
3. Areas within 15 feet of manholes
4. Shoulders
5. Weigh-in-motion areas
6. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

Where IP testing is required, pavement smoothness for each lane must be determined by the international roughness index (IRI) for the left and right wheel paths in an individual lane and then averaging the results. The average of the IRIs from the left and right wheel paths for the same lane is the mean roughness index (MRI) of the lane. The wheel paths are a pair of lines 3 feet from and parallel to the edge of a lane. Left and right wheel paths are based on the direction of travel.

Where IP testing is required, identify areas of localized roughness. Areas of localized roughness must be identified using the ProVAL smoothness assurance analysis by calculating continuous IRI for each wheel path with a 25-foot interval.

Collect profiling data under AASHTO R 56 and analyze data using 250 mm and IRI filters.

Interpret references to "must-grinds" as "localized roughness" and "PI₀" as "MRI" in the RSS for section 39.

39-1.12B Submittals

At least 5 business days before start of initial profiling or changing profiler or operator, submit:

1. IP certification issued by the Department. The certification must be not more than 12 months old.
2. Operator certification for the IP issued by the Department. The operator must be certified for each different model of IP device operated. The certification must be not more than 12 months old.
3. List of manufacturer's recommended test procedures for IP calibration and verification.

As an alternative to the IP and operator certification by the Department, an equivalent certification from the Texas Transportation Institute will be accepted if the certification is dated before July 1, 2013 and is not more than 12 months old.

Within 2 business days after cross correlation testing, submit ProVAL profiler certification analysis report for cross correlation test results performed on test section to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days after each day of inertial profiling, submit profile data to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

The profiling data must include:

1. Raw profile data for each lane.
2. ProVAL ride quality analysis report for IRIs of left and right wheel paths of each lane. Submit in pdf file format.
3. ProVAL ride quality analysis report for MRIs of each lane. Submit in pdf file format.
4. ProVAL smoothness assurance analysis report for IRIs of left wheel path. Submit in pdf file format.
5. ProVAL smoothness assurance analysis report for IRIs of right wheel path. Submit in pdf file format.
6. GPS data file for each lane in GPS exchange. Submit in GPS eXchange file format.
7. Manufacturer's recommended IP calibration and verification tests results.
8. AASHTO IP calibration and verification test results including bounce, block, and distance measurement instrument (DMI).

Submit the raw profile data in unfiltered electronic pavement profile file (PPF) format. Name the PPF file using the following naming convention:

YYYYMMDD_TTCCRRR_D_L_W_S_X_PT.PPF

where:

YYYY = year

MM = Month, leading zero

DD = Day of month, leading zero

TT = District, leading zero

CCC = County, 2 or 3 letter abbreviation as shown in section 1-1.08

RRR = Route number, no leading zeros

D = Traffic direction as NB, SB, WB, or EB

L = Lane number from left to right in direction of travel

W = Wheel path as "L" for left, "R" for right, or "B" for both

S = Beginning station to the nearest foot (i.e., 10+20) or beginning post mile to the nearest hundredth (i.e., 25.06) no leading zero

X = Profile operation as "EXIST" for existing pavement, "INTER" for after prepaving smoothness correction, "PAVE" for after paving, and "CORR" for after final surface pavement correction

PT = Pavement type (i.e., HMA, RHMA, HMA-O, RHMA-O, RHMA-G, etc.)

Within 2 business days of performing straightedge measurements, submit areas requiring smoothness correction. Identify locations of smoothness correction by:

1. Location Number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a lane:
 - 4.1. Lane direction as NB, SB, EB, or WB
 - 4.2. Lane number from left to right in direction of travel
 - 4.3. Wheel path as "L" for left, "R" for right, or "B" for both
5. For correction areas not within a lane:
 - 5.1. Identify pavement area (i.e., shoulder, weight station, turnout)
 - 5.2. Direction and distance from centerline as "L" for left or "R" for right
6. Estimated size of correction area

39-1.12C Inertial Profiler Calibration and Verification Tests

IP equipment must display a current certification decal with expiration date.

Operate the IP according to the manufacturer's recommendations and AASHTO R 57 at 1-inch recording intervals.

Notify the Engineer 2 business days before performing IP calibration and verification testing.

Conduct the following IP calibration and verification tests in the Engineer's presence each day before performing inertial profiling:

1. Block test. Verify the height sensor accuracy under AASHTO R 57, section 5.3.2.3.
2. Bounce test. Verify the combined height sensor and accelerometer accuracy under AASHTO R 57, section 5.3.2.3.2.
3. DMI test. Calibrate the accuracy of the testing procedure under AASHTO R 56, section 8.4.
4. Manufacturer's recommended tests.

Conduct cross correlation IP verification test in the Engineer's presence before performing initial profiling. Verify cross correlation IP verification test at least annually. Conduct 5 repeat runs of the IP on an authorized test section. The test section must be on an existing asphalt concrete pavement surface 0.1 mile long. Calculate a cross correlation to determine the repeatability of your device under Section 8.3.1.2 of AASHTO R 56 using ProVAL profiler certification analysis with a 3 feet maximum offset. The cross correlation must be a minimum of 0.92.

For each 0.1 mile section, your IRI values must be within 10 percent of the Department's IRI values. The Engineer may order you to recalibrate your IP equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your IP operator.

39-1.12D Acceptance Criteria

For areas that require pavement smoothness determined using an IP, the pavement surface must:

1. Have no areas of localized roughness with an IRI greater than 120 in/mi
2. Comply with the MRI requirements shown in the following tables for a 0.1 mile section:

HMA^a Pavement Smoothness Acceptance Criteria

HMA thickness	MRI requirement
> 0.20 foot	60 in/mi or less
≤0.20 foot	75 in/mi or less

^a Except OGFC

OGFC Pavement Smoothness Acceptance Criteria

OGFC placement on	MRI requirement
New construction, or HMA overlay	60 in/mi or less
Existing pavement	75 in/mi or less
Milled surface	75 in/mi or less

For areas that require pavement smoothness determined using a 12-foot straightedge, the HMA pavement surface must not vary from the lower edge of the straightedge by more than:

1. 0.01 foot when the straightedge is laid parallel with the centerline
2. 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane

3. 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

Pavement smoothness may be accepted based on your testing in the absence of the Department's testing.

39-1.12E Smoothness Testing

39-1.12E(1) General

Notify the Engineer of start location by station and start time at least 2 business days before performing smoothness testing.

Remove foreign objects on the pavement surface before testing.

Mark the beginning and ending station on the pavement shoulder before testing. Stationing must be the same when profiling more than one surface.

39-1.12E(2) Inertial Profiler

While collecting the profile data to determine IRI, record the following locations in the raw profile data:

1. Begin and end of all bridge approach slabs
2. Begin and end of all bridges
3. Begin and end of all culverts visible on the roadway surface

Determine the MRI for each 0.1-mile fixed interval using the ProVAL ride quality analysis. Profile the left and right wheel paths of each lane. Calculate the MRI of each lane. A partial section less than 0.1 mile that is the result of an interruption to continuous pavement surface must comply with the MRI specifications for a full section. Adjust the MRI for a partial section to reflect a full section based on the proportion of a section paved.

Determine the areas of localized roughness using a continuous IRI for each wheel path with a 25-foot interval. Localized roughness greater than 120 in/mi must be corrected regardless of the IRI values of a 0.1-mile section.

Determine the MRI of the HMA, except OGFC. If the MRI of the final pavement surface is greater than the MRI acceptance requirement in the table titled "HMA Pavement Smoothness Acceptance Criteria" in section 39-1.12D, correct to the MRI acceptance requirement in the table.

The final surface of HMA must meet MRI acceptance requirements in the table titled "HMA Pavement Smoothness Acceptance Criteria" in section 39-1.12D before placing OGFC.

Determine the MRI of the OGFC. If OGFC MRI is greater than the accepted value in the table titled "OGFC Pavement Smoothness Acceptance Criteria" in section 39-1.12D, correct to the MRI acceptance requirement in the table.

39-1.12E(3) Straightedge

Measure areas that require 12-foot straightedge. If the straightedge measurement is greater than the accepted value in section 39-1.12D, correct to the acceptance requirement.

39-1.12F Smoothness Correction

If the final surface of the pavement does not comply with section 39-1.12D, grind the pavement to within specified tolerances, remove and replace it, or place an overlay of HMA. Do not start corrective work until your method is authorized.

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

If you choose to correct OGFC, the Engineer determines if the corrective method causes raveling. OGFC that is raveling must be removed and replaced.

Corrected HMA pavement areas must be uniform rectangles with edges:

1. Parallel to the nearest HMA pavement edge or lane line
2. Perpendicular to the pavement centerline

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

Where corrections are made within areas requiring testing with IP, reprofile the entire lane length with the IP device.

Where corrections are made within areas requiring testing with a 12-foot straightedge, retest the corrected area with the straightedge.

39-1.12G Prepaving Inertial Profiler

Section 39-1.12G applies to existing asphalt concrete areas receiving an HMA overlay or OGFC. Comply with section 39-1.12A–39-1.12C and 39-1.12E.

Before starting paving operations, perform prepaving IP measurements. Prepaving IP includes taking profiles of the existing pavement, analyzing the data with ProVAL to determine existing pavement IRI, MRI, and areas of localized roughness.

Identify areas of localized roughness greater than 140 in/mi.

Replace section 39-1.16 with:

39-1.16 RUMBLE STRIPS

39-1.16A General

Construct rumble strips in the top layer of existing HMA surfacing by ground-in method.

39-1.16B Materials

Not Used

39-1.16C Construction

Select the method and equipment for constructing ground-in indentations.

Do not construct rumble strips on structures or approach slabs.

Construct rumble strips within 2 inches of the specified alignment. The grinding equipment must be equipped with a sighting device enabling the operator to maintain the rumble strip alignment.

Indentations must comply with the specified dimensions within 0.06 inch in depth and 10 percent in length and width.

The Engineer orders grinding or removal and replacement of noncompliant rumble strips to bring them within specified tolerances. Ground surface areas must be neat and uniform in appearance.

The grinding equipment must be equipped with a vacuum attachment to remove residue from the roadbed.

Dispose of removed material.

On ground areas, apply fog seal coat under section 37-2.

39-1.16D Payment

Rumble strips are measured by the station along the length of the rumble strips without deductions for gaps between indentations.

Replace section 39-1.22 with:

39-1.22 LIQUID ASPHALT PRIME COAT

39-1.22A General

The Engineer designates areas receiving liquid asphalt prime coat.

Prime coat must comply with the specifications for liquid asphalt.

39-1.22B Materials

Liquid asphalt for prime coat must be Grade SC-70.

39-1.22C Construction

Apply at least 0.20 gal of prime coat per square yard of designated area. Do not apply more prime coat than can be absorbed completely by the aggregate base in 24 hours.

If you request and if authorized, you may modify prime coat application rates.

Before paving, prime coat must cure for 48 hours.

Close traffic to areas receiving prime coat. Do not track prime coat onto pavement surfaces beyond the job site.

39-1.22D Payment

The Engineer determines prime coat quantities under the specifications for liquid asphalt.

If there is no bid item for liquid asphalt (prime coat), payment is included in the payment for the HMA involved.

Replace section 39-1.23 with:

39-1.23 HOT MIX ASPHALT TYPE C

39-1.23A General

39-1.23A(1) Summary

Except if specified for Type C, the specifications for HMA Type A apply to HMA Type C.

Produce and place HMA Type C under the Standard construction process.

39-1.23A(2) Submittals

Not Used

For the mix design, determine the OBC at 5.0 percent air void content.

Determine the proposed JMF for HMA Type C from a mix design that has the values for the quality characteristics shown in the following table:

HMA Type C Mix Design Requirements

Quality characteristic	Test method	Value	
Design air void content (%)		4.0	5.0
Air void content (%) ^a	California Test 367	4.0	5.0
Voids in mineral aggregate (% min) ^b	California Test 367		
1/2" grading		14.0	15.0
3/4" grading		13.0	14.0
1" grading			
with NMAS = 1"		12.0	13.0
with NMAS = 3/4"		13.0	14.0
Voids filled with asphalt (%)	California Test 367		
1/2" grading		65.0–75.0	60.0–70.0
3/4" grading		65.0–75.0	60.0–70.0
1" grading		65.0–75.0	60.0–70.0
Dust proportion ^c (P200/Pbe)	California Test 367	0.6–1.2	0.6–1.2
Stabilometer value (min) ^d	California Test 366	37 ^e (Modified) 35 ^f	37 ^e (Modified) 35 ^f

^a Calculate the air void content of each specimen using California Test 309 and 367. Modify California Test 367, Paragraph C5, to use the exact air void content specified in the selection of OBC.

^b Minimum voids in the mineral aggregate (VMA) is dependent upon the nominal maximum aggregate size (NMAS) of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.

^c Asphalt content based on total weight of mix.

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

^e Comply with California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.

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

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

With the minimum quality control testing for the specified construction process, perform sampling and testing at the specified minimum frequency for the quality characteristics shown in the following table:

HMA Type C Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	
Asphalt binder content (%)	California Test 379 or 382	1 per 750 tons and any remaining part	JMF ± 0.30	
Stabilometer Value(min) _{a, b}	California Test 366	1 per 4,000 tons or 1 per 2 business days, whichever is more	37 ^c (Modified) 35 ^d	
Air void content (%) ^{a, e}	California Test 367		Design ± 2	
Percent of crushed particles ^f Coarse aggregate (% min) Two fractured faces Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve) (% min) One fractured face	California Test 205	1 per 5,000 tons or 1 per 5 business days, whichever is more	95	
			90	
Fine aggregate angularity (% min) ^{f, g}	California Test 234		45	
Los Angeles Rattler ^f Loss at 100 rev. (% max) Loss at 500 rev. (% max)	California Test 211	As necessary and designated in the QC plan. At least once per project	12	
			40	
Flat and elongated particles ^f (% max by weight @ 5:1)	California Test 235		10	
Design air void content			4.0	5.0
Field compaction (% of max. theoretical density) ^{h, i, j}	California Test 375	1 per 750 tons or any single location, whichever is less	92-97	91-96
Voids in mineral aggregate (% min) 1/2" gradation 3/4" gradation 1" gradation ^k with NMAS = 1" with NMAS = 3/4"	California Test 367	1 per 4,000 tons or 1 per 2 business days, whichever is more	14.0	15.0
			13.0	14.0
Voids filled with asphalt (%) 1/2" gradation 3/4" gradation 1" gradation	California Test 367		65.0-	60.0-
			75.0	70.0
			65.0-	60.0-
			75.0	70.0
			65.0-	60.0-
			75.0	70.0
Dust proportion ^l (P200/Pbe)	California Test 367	1 per 4,000 tons or 1 per 2 business days, whichever is more (Report Only)	0.6-1.2	0.6-1.2

- ^a Report the average of 3 tests from a single split sample.
- ^b If the stability range is more than 8 points, prepare and test new briquettes.
- ^c Comply with California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.
- ^d Modify California Test 366: 150 tamps at 500 psi tamping pressure and 230 °F compaction temperature; cool specimens to 140 °F; apply additional 500 tamps at 500 psi tamping pressure and 140 °F compaction temperature; apply 12,600 lb leveling load; and perform stabilometer test at 140 °F.
- ^e Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A. Determine theoretical maximum specific gravity under California Test 309. Calculate the air void content of each specimen using California Test 309 and 367. Modify California Test 367, Paragraph C5, to use the design air void content specified.
- ^f Aggregate must comply with the quality specifications before it is treated with lime. During lime treatment except for dry lime on damp aggregate treatment at continuous mixing plants, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Prepare and test 3 samples from a single split sample for aggregate quality at the frequency specified during lime treatment and report test results as the average of the 3 tests.
- ^g The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ^h Determine field compaction for any of the following conditions:
1. 1/2-inch aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
 2. 3/4-inch or 1-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ⁱ To determine field compaction use:
1. In-place density measurements using the method specified in your QC plan.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^j For Standard construction process, take and average 3 cores per 250 tons of HMA placed.
- ^k Minimum VMA dependent upon NMAS of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.
- ^l Asphalt content based on total weight of mix.

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

HMA Type C Acceptance

Quality characteristic	Test method	Value	
Asphalt binder content (%)	California Test 379 or 382	JMF ± 0.30	
Stabilometer Value (min) ^{a, b}	California Test 366	37 ^c (Modified) 35 ^d	
Air void content (%) ^{a, e}	California Test 367	Design ± 2	
Percent of crushed particles ^f	California Test 205	95	
Coarse aggregate (% min) Two fractured faces			
Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve) (% min) One fractured face			
Fine aggregate angularity (% min) ^{f, g}	California Test 234	45	
Los Angeles Rattler ^f	California Test 211	12	
Loss at 100 rev. (% max) Loss at 500 rev. (% max)		40	
Flat and elongated particles ^f (% max by weight @ 5:1)	California Test 235	10	
	Design air void content	4.0	5.0
Field compaction (% of max. theoretical density) ^{h, i, j}	California Test 375	92-97	91-96
Voids in mineral aggregate (% min)	California Test 367	14.0	
1/2" gradation		15.0	
3/4" gradation		14.0	
1" gradation ^k		13.0	
		12.0	13.0
		13.0	14.0
Voids filled with asphalt (%)	California Test 367	65.0-75.0	60.0-70.0
1/2" gradation		65.0-75.0	60.0-70.0
3/4" gradation		65.0-75.0	60.0-70.0
1" gradation			
Dust proportion ^l (P200/Pbe)	California Test 367	0.6-1.2 Report Only	

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

^b If the stability range is more than 8 points, the Engineer prepares and tests new briquettes.

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

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

^e The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A. The Engineer determines theoretical maximum specific gravity under California Test 309. The Engineer calculates the air void content of each specimen using California Test 309 and 367. The Engineer modifies California Test 367, Paragraph C5, to use the design air void content specified.

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

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

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

1. 1/2-inch aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
2. 3/4-inch or 1-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.

ⁱ To determine field compaction, the Engineer uses:

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

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

^k Minimum VMA dependent upon NMAS of JMF. NMAS is defined as 1 sieve size larger than the 1st sieve to retain more than 10 percent.

^l Asphalt content based on total weight of mix.

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

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

1. 1/2-inch aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15.
2. 3/4-inch or 1-inch aggregate grading is specified and used and the specified total paved thickness is at least 0.20 foot and any layer is less than 0.20 foot.

For each 250 tons of HMA production, the Engineer determines a deduction for percent of maximum theoretical density using the factors for each average of 3 density cores shown in the following table:

Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA Type C percent of maximum theoretical density using the average of 3 cores	Reduced payment factor	HMA Type C percent of maximum theoretical density using the average of 3 cores	Reduced payment factor
91.0	0.0000	96.0	0.0000
90.9	0.0125	96.1	0.0125
90.8	0.0250	96.2	0.0250
90.7	0.0375	96.3	0.0375
90.6	0.0500	96.4	0.0500
90.5	0.0625	96.5	0.0625
90.4	0.0750	96.6	0.0750
90.3	0.0875	96.7	0.0875
90.2	0.1000	96.8	0.1000
90.1	0.1125	96.9	0.1125
90.0	0.1250	97.0	0.1250
89.9	0.1375	97.1	0.1375
89.8	0.1500	97.2	0.1500
89.7	0.1625	97.3	0.1625
89.6	0.1750	97.4	0.1750
89.5	0.1875	97.5	0.1875
89.4	0.2000	97.6	0.2000
89.3	0.2125	97.7	0.2125
89.2	0.2250	97.8	0.2250
89.1	0.2375	97.9	0.2375
89.0	0.2500	98.0	0.2500
< 89.0	Remove and replace	> 98.0	Remove and replace

39-1.23B Materials

Asphalt binder used in HMA Type C must be PG 64-28 M.

Aggregate used in HMA Type C must comply with the 1/2-inch HMA Type C gradation for lift thickness between at least 0.15 foot and less than 0.20 foot, and the 1-inch HMA Type C gradation for lift thickness at least 0.25 foot.

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

**Aggregate Gradation
(Percentage Passing)
HMA Type C**

1-inch HMA Type C

Sieve sizes	Target value limits	Allowable tolerance
1"	100	--
3/4"	88-93	TV ± 5
1/2"	72-85	TV ± 6
3/8"	55-70	TV ± 6
No. 4	35-52	TV ± 7
No. 8	22-40	TV ± 5
No. 30	8-24	TV ± 4
No. 50	5-18	TV ± 4
No. 200	3.0-7.0	TV ± 2

3/4-inch HMA Type C

Sieve sizes	Target value limits	Allowable tolerance
1"	100	--
3/4"	90-95	TV ± 5
1/2"	60-75	TV ± 6
No. 4	35-52	TV ± 7
No. 8	22-36	TV ± 5
No. 30	8-18	TV ± 4
No. 200	3.0-7.0	TV ± 2

1/2-inch HMA Type C

Sieve sizes	Target value limits	Allowable tolerance
3/4"	100	--
1/2"	90-98	TV ± 6
3/8"	64-84	TV ± 6
No. 4	42-57	TV ± 7
No. 8	29-39	TV ± 5
No. 30	13-19	TV ± 4
No. 200	3.0-7.0	TV ± 2

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

HMA Type C Aggregate Quality

Quality characteristic	Test method	Value
Percent of crushed particles Coarse aggregate (% min) Two fractured faces	California Test 205	95
Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve.) (% min) One fractured face		90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211	12 40
Sand equivalent ^a (min)	California Test 217	47
Fine aggregate angularity ^b (% min)	California Test 234	45
Flat and elongated particles (% max by weight @ 5:1)	California Test 235	10

^a Reported value must be the average of 3 tests from a single sample.

^b The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock and gravel.

If lime treatment is required, sample coarse and fine aggregate from individual stockpiles during lime treatment except for dry lime on damp aggregate at continuous mixing plants. Combine aggregate in the JMF proportions.

39-1.23C Construction

The 15th and 16th paragraphs of section 39-1.11 do not apply to HMA Type C.

Pave HMA Type C in maximum 0.20-foot-thick compacted layers for 1/2-inch aggregate gradation.

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

Replace section 39-1.30 with:

39-1.30 EDGE TREATMENT, HOT MIX ASPHALT PAVEMENT

39-1.30A General

Section 39-1.30 includes specifications for constructing the edges of HMA pavement as shown.

39-1.30B Materials

For the safety edge, use the same type of HMA used for the adjacent lane or shoulder.

39-1.30C Construction

The edge of roadway where the safety edge treatment is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade areas to receive the safety edge as required.

The safety edge treatment must be placed monolithic with the adjacent lane or shoulder and shaped and compacted with a device attached to the paver.

The device must be capable of shaping and compacting HMA to the required cross section as shown. Compaction must be by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transition to cross roads, driveways, and obstructions.

For safety edge treatment, the angle of the slope must not deviate by more than ± 5 degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

If paving is done in multiple lifts, the safety edge treatment must be placed with each lift.

Short sections of hand work are allowed to construct transitions for safety edge treatment.

For more information on the safety edge treatment, go to:

http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/

You can find a list of commercially available devices at the above Web site under "Frequently Asked Questions" and "Construction Questions."

39-1.30D Payment

Not Used

Add to section 39-6:

The bid item for place hot mix asphalt (miscellaneous area) is limited to the areas shown and is in addition to the bid items for the materials involved.

The Department does not adjust the unit price for an increase or decrease in the prepaving grinding day quantity.

If the Engineer determines more time is required for prepaving grinding than the Contract allows for and if prepaving grinding is a controlling activity, the Engineer makes a time adjustment.

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40 CONCRETE PAVEMENT

Add between the 1st and 2nd paragraphs in section 40-1.01C(7) of the RSS for section 40:

As an alternative to the inertial profiler and operator certification by the Department, equivalent Texas Transportation Institute certification is accepted if the certification is dated before July 1, 2013 and is not more than 12 months old.

Replace section 40-1.01C(8) of the RSS for section 40 with:

40-1.01C(8) Coefficient of Thermal Expansion

Submit 4 test specimens fabricated from a single sample of concrete for coefficient of thermal expansion testing under AASHTO T 336.

Submit your coefficient of thermal expansion test data at:

<http://169.237.179.13/cte/>

Replace section 40-1.01D(7)(a)(v) of the RSS for section 40 with:

40-1.01D(7)(a)(v) Coefficient of Thermal Expansion Testing

Test for coefficient of thermal expansion under AASHTO T 336. Test at field qualification and at a frequency of 1 test for each 5,000 cu yd of paving but not less than 1 test for projects with less than 5,000 cu yd of concrete. This test is not used for acceptance.

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42 GROOVE AND GRIND CONCRETE

Replace the 2nd paragraph of section 42-1.03B with:

To dry concrete pavement grooving or grinding residue before disposal, residue may be stored at the locations shown. Store residue in temporary storage facilities under WM-8, *Concrete Waste Management in the Construction Site Best Management Practices (BMPs) Manual* or under section 13-9.02.

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DIVISION VI STRUCTURES

46 GROUND ANCHORS AND SOIL NAILS

Add to section 46-2.01D(2)(a):

Performance test a minimum of 3 ground anchors. The Engineer determines which anchors are to be performance tested.

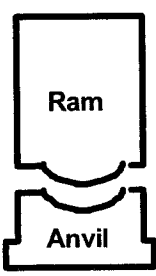

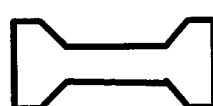

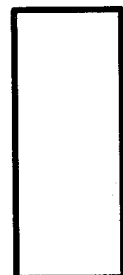
Add to section 46-2.03A:

Expect difficult ground anchor installation at Newport Road OC due to the presence of the following conditions:

CALIFORNIA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION LABORATORY

PILE AND DRIVING DATA FORM

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

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

DISTRIBUTE:

Translab,
Foundation Testing

Translab,
Geotechnical Design

Resident Engineer

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

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

Replace "Reserved" in section 49-3.02A(4)(b) with:

Schedule and hold a preconstruction meeting for CIDH concrete pile construction (1) at least 5 business days after submitting the pile installation plan and (2) at least 10 days before the start of CIDH concrete pile construction. You must provide a facility for the meeting.

The meeting must include the Engineer, your representatives, and any subcontractors involved in CIDH concrete pile construction.

The purpose of this meeting is to:

1. Establish contacts and communication protocol between you and your representatives, any subcontractors, and the Engineer
2. Review the construction process, acceptance testing, and anomaly mitigation of CIDH concrete piles

The Engineer will conduct the meeting. Be prepared to discuss the following:

1. Pile placement plan, dry and wet
2. Acceptance testing, including gamma-gamma logging, cross-hole sonic logging, and coring
3. *Pile Design Data Form*
4. Mitigation process
5. Timeline and critical path activities
6. Structural, geotechnical, and corrosion design requirements
7. Future meetings, if necessary, for pile mitigation and pile mitigation plan review
8. Safety requirements, including Cal/OSHA and Tunnel Safety Orders

Add to section 49-3.02A(4)(d)(ii):

If inspection pipes are not shown:

1. Include in the pile installation plan a plan view drawing of the pile showing reinforcement and inspection pipes.
2. Place inspection pipes around the pile reinforcing cage, in contact with the inside of the outermost spiral or hoop reinforcement and no more than 1 inch clear of the outermost spiral or hoop reinforcement.
3. Place inspection pipes around the pile at a uniform spacing not exceeding 33 inches measured along the circle passing through the centers of inspection pipes. Use at least 2 inspection pipes per pile. Place inspection pipes to provide the maximum diameter circle that passes through the centers of the inspection pipes while maintaining the spacing required herein.
4. Place inspection pipes at least 3 inches clear of the vertical reinforcement. Where the vertical reinforcement configuration does not allow this clearance while achieving radial location requirements, maximize the distance to vertical rebar while still maintaining the requirement for radial location.

Where the dimensions of the pile reinforcement do not allow inspection pipes to be placed as specified above, submit a request for deviation before fabricating pile reinforcement.

Add to section 49-3.02B(6)(c):

The synthetic slurry must be one of the materials shown in the following table:

Material	Manufacturer
SlurryPro CDP	KB INTERNATIONAL LLC 735 BOARD ST STE 209 CHATTANOOGA TN 37402 (423) 266-6964
Super Mud	PDS CO INC 105 W SHARP ST EL DORADO AR 71731 (870) 863-5707
Shore Pac GCV	CETCO CONSTRUCTION DRILLING PRODUCTS 2870 FORBS AVE HOFFMAN ESTATES IL 60192 (800) 527-9948
Terragel or Novagel Polymer	GEO-TECH SERVICES LLC 220 N. ZAPATA HWY STE 11A-449A LAREDO TX 78043 (210) 259-6386

Use synthetic slurries in compliance with the manufacturer's instructions. Synthetic slurries shown in the above table may not be appropriate for a given job site.

Synthetic slurries must comply with the Department's requirements for synthetic slurries to be included in the above table. The requirements are available from the Offices of Structure Design, P.O. Box 168041, MS# 9-4/11G, Sacramento, CA 95816-8041.

SlurryPro CDP synthetic slurry must comply with the requirements shown in the following table:

SLURRYPRO CDP

Property	Test	Value
Density During drilling	Mud Weight (density), API 13B-1, section 1	≤ 67.0 pcf ^a
Before final cleaning and immediately before placing concrete		≤ 64.0 pcf ^a
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	50–120 sec/qt
Before final cleaning and immediately before placing concrete		≤ 70 sec/qt
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	≤ 0.5 percent

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Super Mud synthetic slurry must comply with the requirements shown in the following table:

SUPER MUD

Property	Test	Value
Density During drilling	Mud Weight (Density), API 13B-1, section 1	≤ 64.0 pcf ^a
Before final cleaning and immediately before placing concrete		≤ 64.0 pcf ^a
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	32–60 sec/qt
Before final cleaning and immediately before placing concrete		≤ 60 sec/qt
pH	Glass electrode pH meter or pH paper	8.0–10.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	≤ 0.5 percent

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Shore Pac GCV synthetic slurry must comply with the requirements shown in the following table:

SHORE PAC GCV

Property	Test	Value
Density During drilling	Mud Weight (Density), API 13B-1, section 1	≤ 64.0 pcf ^a
Before final cleaning and immediately before placing concrete		≤ 64.0 pcf ^a
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	33–74 sec/qt
Before final cleaning and immediately before placing concrete		≤ 57 sec/qt
pH	Glass electrode pH meter or pH paper	8.0–11.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	≤ 0.5 percent

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Terragel or Novagel Polymer synthetic slurry must comply with the requirements shown in the following table:

TERRAGEL OR NOVAGEL POLYMER

Property	Test	Value
Density During drilling	Mud Weight (Density), API 13B-1, section 1	≤ 67.0 pcf ^a
Before final cleaning and immediately before placing concrete		≤ 64.0 pcf ^a
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	45–104 sec/qt
Before final cleaning and immediately before placing concrete		≤ 104 sec/qt
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	≤ 0.5 percent

^aIf authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.
Slurry temperature must be at least 40 degrees F when tested.

Add to section 49-3.02C(1):

If the piling center-to-center spacing is less than 3 pile diameters, do not drill holes or drive casing for an adjacent pile until 24 hours have elapsed after concrete placement in the preceding pile and your prequalification test results for the concrete mix design show that the concrete will attain at least 1800 psi compressive strength at the time of drilling or driving.

Add to section 49-3.02C(4):

If the hole is drilled below the specified tip elevation shown, the reinforcement must extend to within 3 inches of the bottom of the drilled hole.

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50 PRESTRESSING CONCRETE

Add to section 50-1.01A:

The details shown for CIP PS box girder bridges are based on a bonded full length draped tendon prestressing system. For these bridges, you may submit a VECP for an alternative prestressing system using bonded partial length tendons if the proposed system and associated details comply with the following requirements:

1. The proposed system and details must provide moment and shear resistances at least equal to those used for the design of the structure shown.
2. The concrete strength must be at least that shown.
3. Not less than 35 percent of the total prestressing force at any section must be provided by full length draped tendons.

4. Anchorage blocks for partial length tendons must be located such that the blocks will not interfere with the placement of the utility facilities shown or of any future utilities to be placed through openings shown.
5. Temporary prestressing tendons, if used, must be detensioned, and the temporary ducts must be filled with grout before completion of the work. Temporary tendons must be either removed or fully encased in grout before completion of the work.

Upon your request, the Department furnishes you with the demand moments and shears used in the design shown.

Submit shop drawings of the proposed system, including all details and supporting checked calculations.

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51 CONCRETE STRUCTURES

Add to section 51-1.03E(9):

51-1.03E(9)(a) Gas Pipeline Casing

Contractor shall furnish and install 12" steel casing and associated pipe supports and assembly in the bridge structure for planned Gas Company pipeline as shown on the plans and in accordance with the Gas Company Standard entitled, "Approved Protective Coatings for Below Ground Corrosion Control," the improvement plans and these special provisions.

The casing pipe shall be 365 feet long, with 12-inch diameter and 0.0375-inch wall thickness. Grade shall be x52 API 5L. The casing wrap shall adhere to the Gas Company Standard entitled, "Approved Protective Coatings for Below Ground Corrosion Control."

The Gas Company shall furnish, install and test the gas pipeline carrier line and associated appurtenances.

Add to the RSS for section 51-1.04:

Payment for furnishing all labor, materials, tools, equipment, and incidentals, for doing all work involved in installing the casing and its assembly as shown on the plans and as directed by the Engineer, including necessary coordination with the Gas Company's representatives is included in the payment for 12" welded steel pipe casing (bridge) and no additional compensation will be allowed therefor.

Drystack surface texture must simulate the appearance of split or broken stones in irregularly layered rock stonework. The texture must not have repetitive or secondary shadows or patterns.

Stain the drystack surface texture under section 59-7.

Replace the 5th paragraph of section 51-1.03G(1) with:

Construct a test panel, including any staining described, for each type of surface texture shown.

Replace item 3 in the list in the 4th paragraph of section 51-4.03B with:

3. Except for box girders, a minimum of 1 inch of deck slab concrete is maintained between precast prestressed deck panels and the top of PC I and double T girders

Add to section 51-4.03B:

Except for box girders and double T girders, provide temporary lateral bracing for girders over railroads. Install bracing at each end of the girder segments and at the midspan. Bracing must be in place before

Property	ASTM Test method	Value
Tensile strength, psi	C 307	1,450 min
Compressive strength, psi	C 579	11,600 min
Bending strength, psi	C 580	2,900 min
Moisture absorption, percentage	C 140	0.5 max
Chemical resistance	C 267	Pass
Freeze-thaw, number of cycles with out weight loss	C 666	1,600 min

70-6.02B Line Drain Frames and Grates

Frames and grates must be heavy duty rated under General Services Administration CID A-A-60005 *Frames, Covers, Gratings, Steps, Manholes, Sump and Catch Basin*. The design and performance requirements include the following:

1. Grated line drain frames and grates must be manufactured of ductile iron complying with section 75-1.02. Frames and grates include bolts, nuts, frame anchors, and other connecting hardware. Galvanizing or asphalt paint coating is not required.
2. Frames and grates, whether one-piece or separate, must be classified heavy duty traffic rated with a transverse proof-load strength of 25,000 pounds
3. Grates and frames must be one piece anchored into the body of the line drain unless shown as removable. Removable grates must be separate from the frame and must:
 - 3.1 Be held in place by locking devices that are tamper resistant
 - 3.2 Provide a minimum repetitive pullout resistance of 340 lb/ft of length after completion of 1,000 hours of salt spray testing under ASTM B 117
 - 3.3 Be match marked in pairs before delivery to the work and grates must fit into the frames without rocking
4. If a combination of one piece frame and grate and removable grates are used, the locations of the removable grates are shown
5. Except for grates installed within designated pedestrian paths of travel, grate design must accept inflow of runoff through openings consisting of a minimum of 60 percent of the total top surface area of the grate. Individual openings or slots must have a dimension not greater than 2 inches measured in the direction of the grated line drain flow line.
6. Grates installed within designated pedestrian paths of travel must be certified as conforming to the requirements of the Americans with Disabilities Act.

70-6.03 CONSTRUCTION

Excavation and backfill must comply with section 19-3.

Grated line drains must be installed in trenches excavated to the lines and grades established by the Engineer. Grade and prepare the bottom of the trench to provide a firm and uniform bearing throughout the entire length of the grated line drain.

Installation of grated line drains and joints must comply with the manufacturer's instructions.

Install to the lines and grades with sections closely jointed and secured to ensure that no separation of the line drains occurs during backfilling.

The frame or grate must not extend above the level of the surrounding concrete backfill.

Connect grated line drains to new or existing drainage facilities as shown.

Backfill with minor concrete.

Place concrete backfill in the trench as shown. Place against undisturbed material at the sides and bottom of the trench in a manner that prevents (1) floating or shifting of the grated line drain and voids or (2) segregation in the concrete.

Immediately remove foreign material that falls into the trench before or during placement of the concrete.

Where necessary construct and compact earth plugs at the ends of the concrete backfill to contain the concrete within the trench.

Secure frames or line drain wall to the surrounding concrete backfill with steel anchoring rods as shown. Alternative securing methods must provide a minimum pullout resistance of 685 lb/ft of length of grated line drain frame.

Concrete backfill must be finished flush with the adjacent surfacing.

The surface of the concrete must be textured with a broom or burlap drag to produce a durable skid-resistant surface.

70-6.04 PAYMENT

Payment for frames and grates is included in the payment for grated line drain.

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DIVISION VIII MISCELLANEOUS CONSTRUCTION

73 CONCRETE CURBS AND SIDEWALKS

Add to section 73-3.01C:

Within 2 business days of performing the surveys, submit preconstruction and post construction surveys signed and sealed by one of the following:

1. Land surveyor registered in the State
2. Civil engineer registered in the State

Add to section 73-3.01D:

For locations shown, perform a preconstruction survey to verify that forms and site constraints will allow the design dimensioning and slope requirements to be achieved. Upon completing construction of these facilities, perform a post construction survey and verify that design dimensioning and slope requirements were achieved. The post construction survey must include a minimum of 3 measurements for each dimension and slope requirement shown. Individual measurements must be equally distributed across the specified slope or dimensional surface.

Add before the 1st paragraph in section 73-3.03:

Before placing concrete, verify that forms and site constraints allow the required dimensioning and slopes shown. Immediately notify the Engineer if you encounter site conditions that will not accommodate the design details. Modifications ordered by the Engineer are change order work.

Replace "Reserved" in section 73-3.02 with:

The concrete for cross gutter must contain at least 590 pounds of cementitious material per cubic yard.

Expansion joint filler must comply with section 51-2.01B(1).

Add to the list in the 1st paragraph of section 73-3.03:

3. As shown

83-1.02B(1)(a)(iii) Submittals

Submit a mix design for the minor concrete to be used. The mix design must show proportions of:

1. Coarse aggregate
2. Fine aggregate
3. Cementitious material
4. Reinforcing fiber
5. Water

Include compressive strength test results with your mix design.

Submit the quantity in pounds of crumb rubber aggregate with your certificate of compliance for crumb rubber aggregate if used.

83-1.02B(1)(a)(iv) Quality Control and Assurance

Not Used

83-1.02B(1)(b) Materials

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

Not Used

83-1.02B(1)(b)(ii) Minor Concrete

Minor concrete must include reinforcing fibers and may include crumb rubber aggregate.

Section 90-2.02B does not apply. Minor concrete must contain at least:

1. 505 pounds of cementitious material per cubic yard if crumb rubber aggregate is used
2. 400 pounds of cementitious material per cubic yard if crumb rubber aggregate is not used

The 3rd paragraph of section 90-2.02C does not apply. Minor concrete must have a maximum aggregate size of 3/8 inch.

All ingredients must be added at the concrete plant before delivery to the job site.

You may use volumetric proportioning under ASTM C 685/C 685M or section 90-3.02B.

Minor concrete must have a 28-day compressive strength from 1,400 to 1,800 psi.

83-1.02B(1)(b)(iii) Crumb Rubber Aggregate

Crumb rubber aggregate must consist of ground or granulated scrap tire rubber from automobile and truck tires. Tire buffings are not allowed. Crumb rubber aggregate must be ground and granulated at ambient temperature.

The gradation of the crumb rubber aggregate must comply with the requirements shown in the following table:

Gradation Requirements	
Sieve size	Percentage passing
1/2"	100
3/8"	90-100
1/4"	35-45
No. 4	5-15
No. 8	0-5
No. 16	0

Crumb rubber aggregate must not contain more than 0.01 percent of wire by mass of crumb rubber and must be free of oils and volatile organic compounds.

Commingling of crumb rubber from different sources is not allowed.

The crumb rubber aggregate must be 3.5 ± 0.5 percent by weight of the concrete.

83-1.02B(1)(b)(iv) Reinforcing Fibers

Reinforcing fibers for minor concrete must be:

1. Manufactured specifically for use as concrete reinforcement from one of the following:
 - 1.1. Polypropylene, polyethylene, or a combination of both.
 - 1.2. Copolymer of polypropylene and polyethylene.
2. Blended ratio from 4 to 5.67 parts by weight of macro synthetic fibers to 1 part by weight of micro synthetic fibers. Synthetic fibers must be:
 - 2.1. Nonfibrillated macro fibers with individual fiber lengths less than $2 \pm 1/2$ inch.
 - 2.2. Fibrillated or monofilament micro fibers of various lengths and thicknesses.
3. Supplied in sealed, degradable bags of appropriate size for adding whole bags to concrete batches.
4. From a commercial source.

The reinforcing fiber content of minor concrete must be from 5 to 6 lb/cu yd.

83-1.02B(1)(b)(v) Coloring Agent

If a color for concrete is specified in section 83-1.02B(1)(b)(i), the coloring agent must be integral to the concrete mix and added at the concrete plant.

83-1.02B(1)(b)(vi) Block-Out Material

Use a commercially available expanded polystyrene foam for the block-out material. The expanded polystyrene foam must have a compressive strength of 13 ± 5 psi at 10 percent deformation when tested under ASTM D1621.

You may substitute an alternative material that meets the compressive strength requirements of the expanded polystyrene foam if authorized.

83-1.02B(1)(c) Construction

83-1.02B(1)(c)(i) General

Areas to receive vegetation control must be cleared of vegetation, trash, and debris. Dispose of removed material.

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

Excavate areas to receive vegetation control. Where vegetation control abuts the existing surfacing, the edge of the existing surfacing must be on a neat line or must be cut on a neat line to a minimum depth of 2 inches before removing the surfacing. The finished elevation of the excavated area to receive vegetation control must maintain planned flow lines, slope gradients, and contours of the job site.

Grade areas to receive vegetation control to a smooth, uniform surface and compact to a relative compaction of not less than 95 percent.

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

83-1.02B(1)(c)(iii) Block Out

If block-out material is supplied in more than 1 piece, tape the pieces together to make a smooth surface on the top and sides.

Ensure block-out material does not move during concrete placement.

83-1.02B(1)(c)(iv) Placing Minor Concrete

Place minor concrete for vegetation control by hand.

Strike off and compact minor concrete with a mechanical or vibratory screed device. Apply a broom finish. Match the finished grade to the adjacent section of vegetation control, pavement, shoulder, or existing grade.

If the curing compound method is used for colored concrete, use curing compound no. 6.

83-1.02B(1)(d) Payment

Not Used

Replace section 83-1.02C(2) with:

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

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

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

1. TYPE SKT-SP-MGS for steel posts or Type SKT-MGS-W for wood posts **TERMINAL SYSTEM** - Type SKT-MGS terminal system must be a SKT 350 sequential kinking terminal, system length 53'-1-1/2", manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type SKT-MGS terminal system shown on the plans. The SKT 350 sequential kinking terminal can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE ET-31 **TERMINAL SYSTEM** - Type ET-31 terminal system must be an ET-31 (4-tube system) extruder terminal, system length 53'-1-1/2", as manufactured by Trinity Highway Products, LLC, and must include items detailed for Type ET-31 terminal system shown on the plans. The ET-2000 PLUS (4-tube system) extruder terminal can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.
3. TYPE 31" X-TENSION - Type 31" X-Tension terminal system must be a 31" X-Tension Guard Rail End Terminal as manufactured by Barrier Systems, Inc., located in Vacaville, CA, and must include items detailed for Type 31" X-Tension terminal system shown on the plans. The 31" X-Tension Guard Rail End Terminal can be obtained from the distributor, Statewide Safety and Signs, Inc., 130 Grobriic Court, Fairfield, CA 94533, telephone (800) 770-2644.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5. Paint must be metallic acrylic resin type spray paint. Before applying terminal system identification, the surface to receive terminal system identification must be removed of all dirt, grease, oil, salt, or other contaminants by washing the surface with detergent or other suitable cleaner. Rinse thoroughly with fresh water and allow to fully dry.

For Type ET-31 terminal system, install a hinged breakaway post at Post 1 and 6'-0" steel yielding terminal posts at Posts 2 through 6. The hinged breakaway post must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. If placed in a pilot or drilled hole, space around the hinged breakaway post must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted.

For Type SKT-SP-MGS terminal system, install the soil tube with soil plate attached at Post 1, hinged breakaway post at Post 2, and 6'-0" W6 x 9 steel posts at Posts 3 through 8. Use a W6 x 15 steel post at Post 1. The soil tube with soil plate must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted.

For Type ET-31 terminal system, install 4'-6" steel foundation tubes with soil plates attached or 6'-0" soil tubes at Posts 1 and 2. Install 6'-0" controlled release terminal posts at Posts 3 through 6. The steel foundation tubes must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For Type SKT-MGS-W terminal system, install the soil tube with soil plate attached at Post 1, breakaway cable terminal post at Post 2, and controlled release terminal posts at Posts 3 through 8. The soil tube must be, at the Contractor's option, driven with or without pilot holes, or placed in a drilled hole. Space around the steel foundation tube must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. A wood post must be inserted into the steel foundation tube by hand. Before the wood terminal post is inserted, the inside surfaces of the steel foundation tube to receive the wood post must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edge of the wood post may be slightly rounded to facilitate insertion of the post into the steel foundation tube.

For Type 31" X-Tension terminal system, the steel post and soil anchor must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel post and soil anchor must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the drilled holes by hand and backfilled in the same manner as the steel post and soil anchor. Wood terminal posts must not be driven. All blocks must be wood or plastic.

For Type 31" X-Tension terminal system, the steel bottom post and I-beam post must be placed in drilled hole. The soil anchor and steel line posts must be, at the Contractor's option, either driven or placed in drilled holes. Space around the steel bottom post, steel line posts and soil anchor must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. All blocks must be plastic.

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

Replace section 83-1.02C(3) with:

83-1.02C(3) Alternative Flared Terminal System

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

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

1. TYPE FLEAT-SP-MGS for steel or FLEAT-MGS-W for wood TERMINAL SYSTEM - Type FLEAT-MGS terminal system must be a Flared Energy Absorbing Terminal 350, system length 37'-6", manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type FLEAT-MGS terminal system shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Industries, Inc., 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE SRT-31 TERMINAL SYSTEM - Type SRT-31 terminal system must be an SRT-350 Slotted Rail Terminal (6-post system), system length 37'-6", as manufactured by Trinity Highway Products, LLC, and must include items detailed for Type SRT-31 terminal system shown on the plans. The SRT-350 Slotted Rail Terminal (6-post system) can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.
3. TYPE 31" X-TENSION - Type 31" X-Tension terminal system must be a 31" X-Tension Guard Rail End Terminal as manufactured by Barrier Systems, Inc., located in Vacaville, CA, and must include items detailed for Type 31" X-Tension terminal system shown on the plans. The 31" X-Tension Guard Rail End Terminal can be obtained from the distributor, Statewide Safety and Signs, Inc., 130 Groblich Court, Fairfield, CA 94533, telephone (800) 770-2644.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5. Paint must be metallic acrylic resin type spray paint. Before applying terminal system identification, the surface to receive terminal system identification must be removed of all dirt, grease, oil,

salt, or other contaminants by washing the surface with detergent or other suitable cleaner. Rinse thoroughly with fresh water and allow to fully dry.

For Type SRT-31 terminal system, install a cable release post at Post 1 and 6'-0" steel yielding terminal posts at Posts 2 through 6. The cable release post and steel yielding terminal posts must be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. If placed in pilot or drilled holes, space around the posts must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted.

For Type FLEAT-SP-MGS terminal system, install the soil tube with soil plate attached at Post 1, hinged breakaway post at Post 2, and 6'-0" W6 x 9 steel posts at Posts 3 through 7. Use a W6 x 15 steel post at Post 1. The soil tube with soil plate must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted.

For Type FLEAT-W-MGS terminal system, install the soil tubes with soil plate attached at Posts 1 and 2, breakaway cable terminal posts at Posts 1 and 2, and controlled release terminal posts at Posts 3 through 6. The soil tubes with soil plates must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The breakaway cable terminal posts must be inserted into the steel foundation tubes by hand and must not be driven.

For Type 31" X-Tension terminal system, the steel post and soil anchor must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel post and soil anchor must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. The wood terminal posts must be inserted into the drilled holes by hand and backfilled in the same manner as the steel post and soil anchor. Wood terminal posts must not be driven. All blocks must be wood or plastic.

For Type 31" X-Tension terminal system, the steel bottom post and I-beam post must be placed in drilled hole. The soil anchor and steel line posts must be, at the Contractor's option, either driven or placed in drilled holes. Space around the steel bottom post, steel line posts and soil anchor must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. All blocks must be plastic.

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

Replace the 14th paragraph of section 83-1.02I with:

Chain link fabric must be 9 gage and comply with AASHTO M 181 for Type IV fabric with a Class B coating.

The bond strength between the coating material and steel of the bonded vinyl-coated chain link fabric must be equal to or greater than the cohesive strength of the PVC coating material.

Full compensation for Chain Link Fabric shall be considered as included in the contract LF for Metal Bridge Railing and no separate payment will be made therefor.

Replace the 1st paragraph of section 83-2.02D(3)(b) with:

Concrete barriers constructed using an extrusion or slip form machine or other similar type of equipment must be made of well-compacted, dense concrete, and the exposed surfaces must comply with section 51. You may be required to submit evidence of successful operation of the extrusion or slip form machine or other equipment.

Submit a QC plan for use of the extrusion or slip form construction method if reinforcement is not fixed in place before placing concrete.

The QC plan must include:

1. Contingency plan for correcting problems in production, transportation, or placement

2. Procedure for splicing concrete barrier reinforcement
3. Procedure for positioning reinforcement during extrusion or slip form operations
4. Test procedure for verifying final positions of horizontal reinforcement at 100-foot intervals, evaluated a minimum of 20 feet behind the trailing extrusion or slip form edge
5. Test report forms to be used that shows (1) positions of reinforcement relative to the top of the barrier, (2) clearance cover from the faces of the barrier to the reinforcement, and (3) station of the tests

If a QC plan is submitted, submit the test report forms within 48 hours of constructing the concrete barrier.

The Department rejects concrete barrier with any reinforcement deviating more than 1 inch from the positions shown.

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84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

Replace "Reserved" in the RSS for section 84-6 with:

84-6.01 GENERAL

84-6.01A Summary

Section 84-6 includes specifications for applying thermoplastic traffic stripes and pavement markings with enhanced wet-night visibility.

Thermoplastic must comply with section 84-2.

84-6.01B Submittals

Submit a certificate of compliance for the glass beads.

84-6.01C Quality Control and Assurance

Within 14 days of applying a thermoplastic traffic stripe or pavement marking with enhanced wet-night visibility, the retroreflectivity must be a minimum of 700 mcd/sq m/lx for white stripes and markings and 500 mcd/sq m/lx for yellow stripes and markings. Test the retroreflectivity using a reflectometer under ASTM E 1710.

84-6.02 MATERIALS

Thermoplastic traffic stripes and pavement markings with enhanced wet-night visibility must consist of a single uniform layer of thermoplastic and 2 layers of glass beads as follows:

1. The 1st layer of glass beads must be on the Authorized Material List under high-performance retroreflective glass beads for use in thermoplastic traffic stripes and pavement markings. The color of the glass beads must match the color of the stripe or marking to which they are being applied.
2. The 2nd layer of glass beads must comply with AASHTO M 247, Type 2.

Both types of glass beads must be surface treated for use with thermoplastic under the bead manufacturer's instructions.

84-6.03 CONSTRUCTION

Use a ribbon-extrusion or screed-type applicator to apply thermoplastic traffic stripe.

Operate the striping machine at a speed of 8 mph or slower during the application of thermoplastic traffic stripe and glass beads.

Apply thermoplastic traffic stripe at a rate of at least 0.38 lb/ft of 4-inch-wide solid stripe. The applied thermoplastic traffic stripe must be at least 0.090 inch thick.

Apply thermoplastic pavement marking at a rate of at least 1.06 lb/sq ft. The applied thermoplastic pavement marking must be at least 0.100 inch thick.

Apply thermoplastic traffic stripe and both types of glass beads in a single pass. First apply the thermoplastic, followed immediately by consecutive applications of high-performance glass beads and then AASHTO M 247, Type 2, glass beads. Use a separate applicator gun for each type of glass bead.

You may apply glass beads by hand on pavement markings.

Distribute glass beads uniformly on traffic stripes and pavement markings. Apply high-performance glass beads at a rate of at least 6 lb/100 sq ft of stripe or marking. Apply AASHTO M 247, Type 2, glass beads at a rate of at least 8 lb/100 sq ft of stripe or marking. The combined weight of the 2 types of glass beads must be greater than 14 lb/100 sq ft of stripe or marking.

84-6.04 PAYMENT

Not Used

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86 ELECTRICAL SYSTEMS

Add to the end of the 1st paragraph of the RSS for section 86-1.01:

Locations of decorative bridge lighting installations are also shown on the structure plans.

Lighting equipment is included in the following structures:

- 1. Newport Road OC (Bridge No. 56-0646)
- 2. Salt Creek Bridge (Bridge No. 56-0647R)

Communication conduit is included in the following structures:

- 1. Newport Road OC (Bridge No. 56-0646)

Sprinkler control conduit is included in the following structures:

- 1. Newport Road OC (Bridge No. 56-0646)

Traffic signal work must be performed at the following locations:

- 1. Newport Road at SB Ramps
- 2. Newport Road NB Ramps

Modify traffic signal work must be performed at the following locations:

- 1. Newport Road at Haun Road
- 2. Newport Road at Antelope Road

Ramp meter work must be performed at the following locations:

- 1. Route 215 NB Newport Road Loop Entrance Ramp
- 2. Route 215 NB Newport Road Entrance Ramp
- 3. Route 215 SB Newport Road Loop Entrance Ramp
- 4. Route 215 SB Newport Road Entrance Ramp

Modify traffic monitoring station (count) work must be performed at the following locations:

- 1. Route 215 SB south of Newport Rd OC
- 2. Route 215 NB north of Newport Rd OC

Add to the list in the 5th paragraph of the RSS for section 86-1.03:

14. LTE Modem Assembly
15. Emergency Vehicle Preemption Sensor
16. Video Detection System (VIDS)
17. Communication System – Network to Serial Adapter Card, CAT 5E Cable, Ethernet Extender, and Ethernet Switch

Replace the 3rd paragraph of section 86-1.06A with:

Traffic signal system shutdowns are limited to periods between the hours of 9:00 a.m. and 3:00 p.m.

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

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

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

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

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

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

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

A schedule for removal and replacement of traffic monitoring devices, including any temporary work, must be submitted to the Engineer for approval. The schedule must be updated monthly along with the progress schedule requirements specified elsewhere.

The Contractor, Engineer and TMS will meet quarterly to review the planning and status of the traffic monitoring work. The meeting will be conducted by the Engineer.

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

temporary or portable detection operations. The Contractor must receive authorization on the type of detection and installation before installing the temporary or portable detection.

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

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

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

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

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

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

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

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

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

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

Add to section 86-2.03B:

Use sleeve nuts on Type 1-A standards. The bottom of the base plate must be 2" min and 3" max above the finished grade.

Add to section 86-2.04A:

The sign mounting hardware must be installed at the locations shown.

Install non-illuminated street name signs on signal mast arms using a minimum 3/4 by 0.020-inch round edge stainless steel strap and saddle bracket. Wrap the strap at least twice around the mast arm, tighten, and secure with a 3/4-inch stainless strap seal. Level the sign panel and tighten the hardware securely.

Set the Type 1 standards with the handhole on the downstream side of the pole in relation to traffic or as shown.

Add to section 86-2.05A:

Conduit installed underground must be Type 3, Schedule 80.

Add to section 86-2.05B:

The conduit in a foundation and between a foundation and the nearest pull box must be Type 3, Schedule 80.

Add to section 86-2.05C:

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

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

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

Replace the 3rd paragraph in section 86-2.06A(2) of the RSS for section 86-2.06 with:

In a ground or sidewalk area, embed the bottom of a pull box in crushed rock.

Replace "Reserved" in section 86-2.06B of the RSS for section 86-2.06 with:

86-2.06B(1) General

86-2.06B(1)(a) Summary

Section 86-2.06B includes specifications for installing non-traffic-rated pull boxes.

86-2.06B(1)(b) Submittals

Before shipping pull boxes to the job site, submit a list of materials used to fabricate the pull boxes to METS. Include:

1. Contract number
2. Manufacturer's name
3. Manufacturer's installation instructions
4. Your contact information

Submit reports for pull boxes from an NRTL-accredited laboratory.

Before installing a pull box and cover, submit the manufacturer's replacement warranty for them.

86-2.06B(1)(c) Quality Control and Assurance

86-2.06B(1)(c)(i) Functional Testing

The pull box and cover must be tested under ANSI/SCTE 77, "Specification for Underground Enclosure Integrity."

86-2.06B(1)(c)(ii) Warranty

Provide a 2-year manufacturer's replacement warranty for the pull box and cover. The warranty period starts on the date of Contract acceptance.

Deliver replacement parts within 5 business days after you receive notification of a failed pull box, cover, or both to the Department's Maintenance Electrical Shop at:

175 West Cluster Street, San Bernardino, CA 92408

86-2.06B(2) Materials

The 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 pull box cover must have an electronic marker cast inside.

A pull box extension must be made of the same material as the pull box and attached to the box to maintain the minimum combined depths.

Include recesses for a hanger if a transformer or other device must be placed in a pull box.

The bolts, nuts, and washers must be a captive design.

The captive bolt must be capable of withstanding a torque from 55 to 60 ft-lb and a minimum pull-out strength of 750 lb. Perform the test with the cover in place and the bolts torqued. The pull box and cover must not be damaged while performing the test.

Hardware must be stainless steel with 18 percent chromium and 8 percent nickel content.

Galvanize ferrous metal parts under section 75-1.05.

The manufacturer's instructions must include:

1. Quantity and size of entries that can be made without degrading the strength of the pull box below the tier 22 load rating
2. Locations where side entries cannot be made
3. Acceptable method for creating the entry

The tier 22 load rating must be labeled or stenciled by the manufacturer on the inside and outside of the pull box and on the underside of the cover.

86-2.06B(3) Construction

Do not install a pull box in curb ramps or driveways.

A pull box for a post or a pole standard must be located within 5 feet of the standard. Place the pull box adjacent to the back of the curb or edge of the shoulder. If this is impractical, place the pull box in a suitable, protected, and accessible location.

Cover the pull box with a plastic sheet and then bury pull box in soil from 6 to 8 inches below grade, where shown on the plans.

Plastic sheets must be 20 mil thick and made of HDPE or PVC virgin compounds.

Add to section 86-2.08A:

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

Replace the 1st sentence of the 1st paragraph of section 86-2.08E with:

Signal interconnect cable must be the 6-pair type with stranded tinned copper no. 20 conductors.

Add to section 86-2.08:

86-2.08F Category 5E Cable

86-2.08F(1) General

86-2.08F(1)(a) Summary

Section 86-2.08F includes specifications for installing category 5E cable.

86-2.08F(1)(b) Quality Control and Assurance

Category 5E cable must be less than 328 feet of finished cable and the installations must be certified.

86-2.08F(2) Materials

Category 5E cable must be the unshielded, outdoor rated, non-gel filled type, and must meet the requirements of TIA/EIA 568, Category 5E Cable.

Category 5E cable must meet the following:

1. The cable must contain 8 conductors, each of which must be No.24, minimum, solid bare copper conductors. Each conductor must be insulated with polyolefin, polyethylene, polyvinyl chloride or fluorinated ethylene propylene material.
2. The cable jacket must be rated for a minimum of 300 V and 140°F and must be polyvinyl chloride, polyethylene, polyolefin or fluorinated ethylene propylene. The jacket must be black, gray, or blue. The jacket must be marked as required by NEMA. The jacket must be marked at intervals of not more than 3 feet with the cable identification: manufacturer's name, product identification, number of conductors and conductor size, and voltage and temperature ratings. Cable length markings may be sequentially alternated with the cable identification markings at not more than every other interval.
3. The finished outside diameter of the cable must not exceed 1/2-inch.

86-2.08F(3) Construction

The cable run between components must be continuous without splices. Provide a minimum of 3 feet of slack at each pull box, junction box or vault, and a minimum of 9 feet slack at each cabinet.

Terminate the ends of category 5E cable at controller and telephone demarcation cabinets with Type 110 punch down blocks.

86-2.08F(4) Payment

Not Used.

Replace the 1st paragraph of section 86-2.09E with:

Splices must be insulated by "Method B."

Delete the 6th and 7th paragraphs of section 86-2.09E.

Add to section 86-2.11A:

Continuous welding of exterior seams in service equipment enclosures is not required.

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

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

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

Service equipment enclosures must be the aluminum type.

Replace "Reserved" in section 86-2.11B with:

Electric service (irrigation) must be from the service points to the irrigation controllers (IC) and to the spaces provided in the irrigation controller enclosure cabinets (CEC) for irrigation controllers as shown.

Irrigation Controller (IC) "A": Electric service (irrigation) must be a metered 120/240 V(ac), single-phase service in a Type III service equipment enclosure.

Nameplate inscriptions must be as follows:

Item	Inscription
Metering equipment enclosure	IC "A"

The inscription on the other nameplates must be the letter designation used on the plans and in the special provisions.

Conductors, conduit, and pull boxes to the pull box adjacent to irrigation controller enclosure cabinets and irrigation controllers are included in the payment for electric service (irrigation).

Replace section 86-2.18 with:

86-2.18 NUMBERING ELECTRICAL EQUIPMENT

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

Delete 2nd sentence of 3rd paragraph of section 86-2.18.

Add to section 86-2:

86-2.19 CLOSED CIRCUIT TELEVISION SYSTEMS

86-2.19A GENERAL

86-2.19A(1) Summary

Section 86-2.19 contains requirements for the closed circuit television systems.

Each CCTV system must consist of a Camera Pole, CCTV camera assembly, camera cable and CCTV Cabinet assembly.

86-2.19A(2) Definitions

APA: Aluminum polymer and aluminum with adhesive

CLI: A Command-Line Interface is a means of interaction with a computer program where the user issues commands to a program in the form of successive lines of text.

DE9: D-sub 9 male and female connectors for network cable connection.

DHCP: The Dynamic Host Configuration Protocol is a network protocol to configure network devices so that they can communicate on an IP network.

DNS: Domain Name System/Server is an Internet service that translates domain names into IP addresses.

MPEG-4-ISO/IEC 14496-2: A Moving Picture Expert Group is a method of defining compression of audio and visual digital data.

PE: Polyethylene is an insulated material for the cables and conductors.

PTZ: Pan/Tilt/Zoom is a function for the CCTV camera.

SD: Secure Digital memory card format.

SMPTE-170M: Society of Motion Picture and Television Engineers Committee on Television Technology. SMPTE 170M is used for some CCTV applications.

SNMP: Simple Network Management Protocol is an Internet-standard protocol for managing devices on IP networks.

TELNET: network protocol used on the Internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection.

TDC: A Time-Domain Reflectometer is an electronic instrument used to characterize and locate faults in metallic cables. It can also be used to locate discontinuities in a connector, printed circuit board, or any other electrical path.

UTP: Unshielded Twisted Pair cable. UTP cable is a 100 Ω copper cable that consists of 2 to 1800 unshielded twisted pairs surrounded by an outer jacket. They have no metallic shield. This makes the cable small in diameter but unprotected against electrical interference. The twist helps to improve its immunity to electrical noise.

VEU: Video Encoder Unit is a device enables compression or decompression of digital video.

86-2.19A(3) Submittals

A minimum of 10 working days before the scheduled delivery of the closed circuit television camera assembly to the project site, submit:

1. A certificate of compliance certifying that the closed circuit television camera assembly complies with the requirements of the special provisions. The certificate must include a copy of all applicable test reports on the closed circuit television camera assembly.
2. Four sets of documentation containing complete specifications and operation details of each of the components of the CCTV camera assembly.
3. Four copies of the maintenance manuals for the pan and tilt unit.
4. Manufacturer's cut sheets or specifications data of CCTV camera cable assemblies, including connectors with strain relief back shells.
5. A copy of the CCTV camera cable assembly testing procedures and manufacturer's test results.

86-2.19A(4) Quality Control and Assurance

86-2.19A(4)(a) Pre-Acceptance Testing

Notify the Engineer in writing fifteen days prior to the scheduled testing. All testing must be performed by you, at a mutually agreed time and place, and in the presence of the Engineer. Demonstrate all the features of the CCTV system. Provide the necessary equipment required to access the CCTV equipment for testing. The Engineer will use the results from the pre-acceptance testing, and may discuss with the on-site technician, to determine settings used in final testing and documentation of the CCTV system.

86-2.19A(4)(b) Testing and Documentation

You are responsible for all testing and documentation required for approval and acceptance of the production, installation, and operation of these materials and equipment. The following identifies the specific quality control requirements for testing and documentation:

1. Test all cables, after installation with connectors attached, for continuity and shorts or grounds. Test the coaxial component of camera cable for attenuation and faults using a time domain reflectometer (TDR). One or more of the following defines a fault in the cable:
 - 1.1. Return loss measurements indicating that attenuation exceeds 3 dB in the band from 5 MHz to 30 MHz in a portion of cable less than 10 feet long.
 - 1.2. A return loss measurement indicating that there is a short, cut or open circuit in the cable.
 - 1.3. A visual inspection that reveals exposure of or damage to the cable shielding.
2. Adjust and set limit stops to the pan and tilt unit at each camera site to prevent the view of the areas outside of the roadway system. The final settings will be approved by the Engineer.
3. Perform a local functional test at the CCTV location.
4. Verify all the CCTV features.
5. You must provide all test equipment

Upon completion of work, each CCTV station must be subjected to post-installation tests as outlined herein. All software must be provided and loaded before the start of testing. The Contractor must provide all necessary equipment required to access the CCTV equipment for testing. This testing must be completed at:

District 8 TMC
13892 Victoria Street
Fontana, CA 92336

86-2.19A(4)(c) Warranty

Furnish 2 year replacement warranty from the manufacturer of CCTV camera assembly and video encoder against defects in materials and workmanship or failures. The effective date of the warranty is the date of acceptance of the installation. Submit all warranty documentation before installation.

Replacement CCTV camera assembly and video encoder must be furnished within 10 days of receipt of a failed unit. The Department does not pay for replacement.

Deliver replacement CCTV camera assembly and video encoder to Caltrans TMC at:

District 8 TMC
13892 Victoria Street
Fontana, CA 92336

86-2.19B MATERIALS

86-2.19B(1) Closed Circuit Television Camera Assembly

Prototype equipment will not be allowed. All equipment must be current standard production units.

The CCTV camera assembly must include these components:

1. Camera
2. Motorized zoom lens
3. Environmental enclosure with sun shield or shroud
4. Pan and tilt unit
5. Video encoder unit

The CCTV camera assembly, including the pan and tilt unit must not exceed 11 inches wide by 17 inches high by 14 inches deep. Any external cables must not interfere with or limit the continuous pan and tilt operation. The weight must not exceed 20 pounds.

The CCTV camera assembly must have all necessary wiring, cables, and connectors. All CCTV camera assemblies must be plug-compatible, interchangeable and suitable for use with the CCTV camera cable assembly described in the special provisions.

You must apply an approved weather-resistant spray to the inside of the connectors before engaging the connectors. Closed circuit television camera assembly components must be rated for NEMA 4X, IP66/67 and ASTM-B117.

86-2.19B(2) Camera

86-2.19B(2)(a) Technical Requirements

All cameras supplied must meet the following:

Parameter	Specification
Image Sensor	Progressive Scan CCD
Image Size	1/4" Format 3.6 mm (H) 2.7 mm (V)
Image Resolution	540 horizontal; 400 vertical
Picture Elements (total)	811 (H) x 508 (V)
Video Output:	NTSC, 1 V p-p @ 75 ohms, unbalanced.
Day/Night Operation	Adjustable (Auto, Color and Mono Modes) via removable IR cut filter
Maximum Lens Aperture	f/1.4 (wide) to f/4.2 (tele)
Minimum Optical Zoom Range	35X, 3.4 mm to 119 mm with 12X Digital zoom
Optical Zoom Speed	Two speeds, from approximately 3.5 to 5 seconds full range
Horizontal Angle of View (Optical)	56° to 1.7°; At 10X Digital: 55.8° to 0.17°.
Minimum Focus Distance	40" in narrow angle, 0.4" in wide angle
Auto Focus	Selectable Auto/Manual; Minimum Scene Illumination for Reliable Auto Focus, 30% video.
Manual Shutter	Selectable shutter speeds shall be 1/60; 1/120; 1/180; 1/250; 1/500; 1/1,000; 1/2,000; 1/4,000; 1/10,000; 1/30,000 second
Auto Iris	Auto Iris; Iris must automatically adjust to compensate for changes in scene illumination to maintain constant video level output within sensitivity specifications
Sensitivity	Sensitivity: Scene Illumination @ F1.4 a. 0.1 fc (1.0 lux) @ 1/60 shutter, color mode b. 0.01 fc (0.1 lux) @ 1/4 shutter, color mode c. 0.005 fc (0.05 lux) @ 1/2 shutter, color mode d. 0.001 fc (0.01 lux) @ 1/4 shutter, mono mode
Power consumption	<95 Watts
Camera/receiver/P&T driver (pan and tilt in motion) power	<40 Watts
Power for the heater (heater on)	<6 Watts

86-2.19B(2)(b) Electrical Requirements

All cameras supplied must meet the following:

Parameter	Specification
Operating Voltage	89 to 135 VAC, +/- 3 HZ Comply with NEMA-TS2, Para 2.1.2 and 2.1.3
Video Output Connector	Standard BNC bulkhead on rear of camera
Signal To Noise Ratio	>50 dB
Synchronization	Internal sync or phase adjustable line lock
Gain Control	Automatic
Automatic Back Focus (Automatic White Balance)	Required

86-2.19B(2)(c) Maintenance Functions

Camera must support the following:

1. Querying of camera parameters via the Ethernet connection.
2. The camera parameters consists of:
 - 2.1. Serial Number
 - 2.2. Software Revision
 - 2.3. Assembly Date
 - 2.4. Camera Model Number
3. Internal temperature and pressure monitoring and reporting
4. Remote software upload and updates via Ethernet
5. Camera device auto discovery of IP address
6. Camera system auto re-connect
7. Camera system reset
8. Save and restore camera system start-up configuration

86-2.19B(2)(d) IP Management

Provide the following network configuration properties:

1. IP Configuration: DHCP or Static IP address entry.
2. Net mask address entry
3. Gateway address entry
4. Domain name entry
5. DNS server entry

Programming must be stored non-volatile memory and the CCTV assembly firmware must be updateable via serial communication.

86-2.19B(2)(e) Environmental Requirements

All cameras supplied must meet the following:

Parameter	Specification
Operating Temperature	From -30 to 165 °F
Operating Humidity	From 0 to 100 percent non-condensing

86-2.19B(2)(f) Environmental Enclosure

The environmental enclosure must be the sealed, pressurized type, designed to withstand exposure to sand, dust, fungus, and salt atmosphere, and house the assembled camera, motorized zoom lens and all internal wiring.

The enclosure must include an internal thermostatically controlled heater assembly to minimize external faceplate condensation.

You have the option of providing a sealed, pressurized integrated optics cartridge (IOC) housed in a NEMA 4X rated enclosure.

The enclosure or IOC must be pressurized with 5 psi dry nitrogen. The enclosure must have a valve for pressurizing. In addition, a pressure relief valve with a 20 psi rating must be provided to protect the enclosure from overcharging. The notation "CAUTION - PRESSURIZED" must be printed on the enclosure. The letter height must be at least 1/4 inch.

86-2.19B(2)(g) Motorized Zoom Lens

The lens must have motors for zoom, focus and iris.

The lens must have capability for focus and zoom preset positions. A telescopic converter or extender must not be used to achieve required focal length range.

When the camera is pointed at a very bright object and or when the camera and lens is first turned on, the image produced by the lens and camera combination must not optically "oscillate" (i.e., produce an image that alternates from too light to too dark) or otherwise be unstable.

Each lens must have an automatic, motor-driven iris with manual override.

The lens must include mechanical or electrical means to protect the motors from over running in the extreme position.

The iris must be controlled directly through the camera in automatic mode and from any keyboard connected into the camera system in the manual mode. The automatic iris must provide continuous aperture adjustments of the lens as determined by the amount of light reaching the camera imager. The power supply and electronics for iris motor must be contained within the environmental housing.

When the power is removed from the lens, the lens iris must automatically close.

The motorized-iris cable must be strain relieved or sufficiently rugged such that the cable will not fail at the point where it leaves the lens assembly.

86-2.19B(2)(h) Environmental enclosure with sun shield or shroud

The housing must meet the following:

Parameter	Specification
Construction	All aluminum
Finish	White, light beige or gray that is either baked enamel or powder coat
Weight	Less than 20 lb excluding heater
Camera Mounting	Platform mount with adjustment fore and aft

The camera lens must be positioned in the center of the housing window.

The housing unit must have lens preset capabilities.

The housing must not interfere with the widest viewing angle of the motorized zoom lens.

The camera enclosure must not incur any physical damage after a shock, return to normal operation immediately and operate within the specified vibration (see Note 1 below table).

Parameter	Specification
Shock	Up to 10 G while in non-operation mode
Vibration	From 5 to 60 Hz with 0.083 inch total excursion, and 5 G rms vibration from 60 to 1000 Hz.

Note 1: Where the manufacturer's cut sheet or specification data does not contain shock and vibration data a listing of at least 2 project sites with identical equipment, with similar installation conditions and similar traffic patterns showing continuous functional performance of at least 2 years may be substituted.

Any enclosure supplied must include a sun shield or shroud to protect the housing from the direct rays of the sun. The sun shroud must be made specifically for the model of enclosure that is selected.

86-2.19B(2)(i) Pan And Tilt Unit

The pan and tilt unit must consist of the pan and tilt unit itself along with any electrical or communication interfaces required to perform the functions specified.

The pan and tilt unit must be designed to operate under a full range of environmental conditions. The pan and tilt unit with camera assembly mounted must withstand a wind load of 80 mph. The cable connector must be fully weather protected. External body components must be manufactured from aluminum that have been anodized, painted or coated to prevent oxidation and corrosion.

Access into the pan and tilt unit for routine maintenance or adjustments must not require removal of the pan and tilt from the installation site, nor removal of the camera enclosure from the pan and tilt unit. Access cover must be readily removable regardless of the tilt position.

86-2.19B(2)(i)(i) Technical Requirements

Parameter	Specification
Pan and Tilt Worms	Ground and polished Stainless Steel
Pan and Tilt Worm Gears	Non-metallic material
Camera Mount	Compatible with camera housing
Bearings on Rotating Surfaces	Heavy duty roller type
Overload Protection	Provided - internal
Operating Temperature	From -30 to 165 °F
Construction	Corrosion resistant steel or aluminum
Finish	Weather resistant paint or polyurethane
Seals	"O" ring or gaskets for all weather protection of pan and tilt unit and cables.

86-2.19B(2)(i)(ii) Functional Requirements

The housing must meet the following:

Parameter	Specification
Braking: Pan And Tilt	Mechanical or Electrical to limit coast
Overload Protection	Motors: Impedance protected
Angular Travel	Pan: From 20 to -90 degrees horizontal, Continuous Tilt: From +90 degrees up to -90 degrees down
Pan Speed	From 0.1 to 80 degrees/s variable-speed
Tilt Speed	From 0.1 to 40 degrees/s variable-speed
Pan And Tilt Position Preset	Positions camera to a predetermined azimuth, elevation and lens position (Minimum of 64 Presets)

86-2.19B(2)(i)(iii) Pan and Tilt Stops

The pan and tilt unit must have pan and tilt stops. The settings of these pan and tilt stops will be determined by the Engineer.

86-2.19B(2)(j) Software and Operational Requirements

The camera protocol must include integrated video camera system communication drivers for flexibility and system interoperability. The camera system must support both serial TIA-422 and TIA-232 communication channels at a minimum, allowing field selection of the following protocol drivers as required.

86-2.19B(2)(j)(i) Operational Parameters

Operational parameters must meet the following:

1. Serial data communications ports conforming to TIA-232 and TIA-422.
2. Configurable to support NTCIP 1205 v01.08 - NTCIP Objects for CCTV camera control, Cohu and Javelin protocols or equivalent.
3. Via the CCTV protocol, the user must be able to obtain camera position information including tilt angles, pan positions and zoom levels. The information must be supplied as from zero to 359 degrees azimuth and from -95 to +95 degree elevation.
4. TCP/IP 100 Base T Fast Ethernet data communication port.

86-2.19B(2)(k) Closed Circuit Television Camera Cable Assembly

The closed circuit television (CCTV) camera cable assembly must conform to the details as shown.

86-2.19B(2)(k)(i) Technical Requirements

Camera cable must include the following:

1. flexible 75 Ω coaxial cable
2. power conductors
3. control cable
4. separate CAT 5E outdoor rated cable
5. Connectors with strain relief backshells
6. Cable support grip to be hung from "J" hook

Camera cable connectors must be in accordance with manufacturer's recommendation.

Camera cable must not be spliced.

Install cables without damaging the conductors, insulation, or jacket. Do not bend coaxial cables tighter than the manufacturer's recommended bending radius.

Provide a minimum of 3 feet of cable slack for equipment movement at pull boxes, vaults or cabinets. The cable must be secured and coiled neatly.

Provide a ground wire between the CCTV camera assembly and the camera pole.

When camera cable is broken out onto a terminal strip, terminate the coaxial cable with a BNC type connector so that it's an integral part of the terminal strip.

Install cables and connectors to allow the following:

1. Disconnecting the camera and lens without removing environmental camera housing
2. Removing the environmental camera enclosure (including camera) without removing the pan and tilt drive

You must provide all materials necessary to make the connectors functional. All materials used to make the connectors must be compatible and must adhere to manufacturer's recommendations.

86-2.19B(3) Video Encoder Unit

The CCTV assembly system must fully integrate within the H.264/MJPEG encoding component. Video encoder unit must have the following features:

1. Video Encoding: H.264 (Main Profile/Level 3.1) and MJPEG standards.
2. Video Streams: Two independently configurable streams; (2) H.264 streams or (1) H.264 and (1) MJPEG or (1) H.264 or MJPEG and 1 NTSC.
3. Video Stream Configuration Properties (Stream Settings):
 - 3.1. Video Stream 1: H.264
 - 3.2. Video Stream 2: H.264 or MJPEG
4. Image Resolution: 720p, D1, VGA, CIF
5. Streaming Mode: CBR or VBR
6. Frame Rate: 30, 15, 7, 4, 2, 1
7. Connection Types: Uni-cast, multi-unicast or multi-cast
8. Data Rate: Adjustable from 64 k to 8 Mb/s CCTV assembly Video Latency: <150 ms
9. Network Protocol Layers: RTP, RTSP, UDP, TCP, IP, HTTP, IGMPv2, ICMP, ARP as a minimum

86-2.19B(3)(a) Functional Capabilities

Operational parameters must meet the following:

1. Provide an integrated network internet protocol (IP) camera providing: 480p/30 video with H.264/MJPEG compression and encoding for providing video images transported over standard Ethernet infrastructures.
2. Integrate an SDTV standards 480p resolution at 30 frames per second camera, with 35X motorized zoom optics, day and night capability, an H.264/MJPEG ASIC based encoding engine and network communication circuitry, automatic and user-selectable speed setting.
3. The H.264/MPEG encoded video must support 30 frames per second @ SDTV 480p resolution with support for uni-cast and multi-cast connections, using RTP/RTSP network layers.
4. Provide a software development kit (SDK) for allowing any 3rd party developers all necessary tools for integrating the camera assembly system into the users control system environment.
5. Provide hybrid capability delivering both Ethernet and analog composite video and TIA-422 serial connections for external system connections and control.
6. The positioning drive system must provide speed capability from 0.1 to 80 degrees per second, with a 0.25-degree repeatability, 360 degree continuous pan rotation, and from +90 to -90 degree tilt range as a minimum.
7. Include an advanced ID generation capability for indications of viewing direction, compass setting, azimuth/elevation position, location descriptors and user defined image/logo.

86-2.19C CONSTRUCTION

Not used

86-2.20D PAYMENT

Not used

Add to section 86-2:

86-2.20 VIRTUAL PRIVATE NETWORK (VPN) SECURE ROUTER

86-2.20A GENERAL

86-2.20A(1) Summary

Section 82-2.20 includes specifications for Security Router.

The VPN Secure Router (VSR) is a Firewall/VPN/Router and must have Layer 2 and Layer 3 redundancy features combined with a firewall for connection of the various equipment as shown on the plans.

86-2.20A(2) Acronym

NAT: Network Address Translation

VPN: Virtual Private Network

86-2.20A(3) Submittals

All manuals, software and warranty forms must be submitted with the VSR for acceptance before installation.

86-2.20A(4) Quality Control and Assurance

The VSR must have a 5-year replacement warranty from the manufacturer against any defects or failures.

86-2.20B MATERIALS

86-2.20B(1) General

The VSR must meet the following industry standards, protocols and compliances:

1. Standards must have the following:
 - 1.1. 802.3 for 10BaseT
 - 1.2. 802.3u for 100BaseT(X) and 100 BaseFX
 - 1.3. Compatibility to Cisco ASA devices

2. Interface
 - 2.1. Serial: DB9 or RJ-11
3. Ports
 - 3.1. Minimum 2 Fast Ethernet: 2 x 10/100 Mbits/s.
4. Routing
 - 4.1. Static routing
 - 4.2. 1-to-1 NAT
 - 4.3. Port forwarding
5. Protocols
 - 5.1. SNMPv1/v2/v3
 - 5.2. HTTPS
 - 5.3. NTP
 - 5.4. SSH
 - 5.5. DHCP Server/Client
 - 5.6. VPN (SSL/IPsec)
6. LED Indicators
 - 6.1. Status
 - 6.2. VPN
 - 6.3. Link Status
 - 6.4. Data
7. Firewall
 - 7.1. Stateful inspection
 - 7.2. Filter: IP and MAC address, ports, protocol
8. Configuration
 - 8.1. Web based GUI
9. Environmental
 - 9.1. Operating temperature: 32 to 140 °F.
 - 9.2. Operating humidity: from 5 percent to 95 percent (non-condensing).
 - 9.3. Storage temperature: from -40 to 185 °F.
10. Power requirements
 - 10.1. Input voltage: 12/24/48 V(dc) redundant
11. Physical characteristics
 - 11.1. Housing: Metal, IP20 or IP 30 protection rating
 - 11.2. Fanless Design
 - 11.3. DIN Rail Mount

86-2.20C CONSTRUCTION

86-2.20C(1) General

Furnish, install, configure and test the VSR according to the plans, the manufacturer's instructions, and adjusted per field conditions with the Engineers approval as shown.

86-2.20D PAYMENT

Not used.

Add to section 86-2:

86-2.21 Model 170 Ethernet Card

86-2.21A General

86-2.21A(1) Summary

The Model 170 Ethernet card provides network connectivity to the Model 170 controller and must comply with NEMA TS1/2 Environmental Requirements for Traffic Control Equipment.

You must configure and test all cards before acceptance.

The following network information will be provided to you and you must program the equipment prior to all tests:

1. IP addresses
2. Mask
3. Gateway

86-2.21A(2)(b) Warranty

Provide a written warranty against defects in materials and workmanship for a minimum period of 3 years. The effective date of the warranty is the date of successful completion of acceptance testing. The manufacturer must furnish replacement equipment within 5 days after receipt of the failed parts. The Department does not pay for the replacement parts. Deliver replacement equipment to the following maintenance electrical shop:

District 8 - Caltrans Electrical Maintenance Yard
175 West Cluster Street
San Bernardino, CA 92408

All warranty documentation must be submitted before installation.

86-2.21B Materials

The card must conform to Chapter 2, Section 5 of the TEES except for the following:

1. Environmental requirements
 - 1.1. Operating temperature: From -40 to 165 °F
 - 1.2. Relative humidity: From 5 to 90 percent (non-condensing)

86-2.22C Construction

Install the Model 170 Ethernet card as per the manufacturer's instructions.

86-2.22D Payment

Not used.

Add to section 86-2.XX

86-2.XX ETHERNET SWITCHES

86-2.XXA GENERAL

86-2.XXA(1) Summary

Section 82-2.XX includes specifications for outdoor Ethernet switch.

The Ethernet switch (ES) provides network expansion and must provide a minimum of six ports, 10/100BaseTX, for connection of the various equipment as shown on the plans.

86-2.XXA(2) Abbreviations

ESD: Electrostatic Discharge

IEC: International Electrotechnical Commission

IEEE: Institute of Electrical and Electronics Engineers

MDI: Medium Dependent Interface

MDIX: Medium Dependent Interface Crossover

MII: Medium Independent Interface

86-2.XXA(3) Submittals

All manuals, software and warranty forms must be submitted with the ES for acceptance before installation.

86-2.XXA(4) Quality Control and Assurance

86-2.XXA(4)(a) General

86-2.21A(2)(a) Warranty

Provide a written warranty against defects in materials and workmanship for a minimum period of 3 years. The effective date of the warranty is the date of successful completion of acceptance testing.

86-2.XXB Materials

86-2.XXB(a) General

The ES must meet the following industry standards, protocols and IEEE compliances:

1. Standards:
 - 1.1. 802.3 (10Base-T ethernet).
 - 1.2. 802.3u (100Base-TX fast ethernet).
 - 1.3. 802.3x flow control, back pressure flow control.
 - 1.4. Supports auto MDI /MDIX.
 - 1.5. Compliant with NEMA TS1 and TS2 environmental requirements for traffic control equipment.

Protocols

- 3.1. IGMP v1 /v2.

2. Switch technology

- 2.1. Store and forward.

4. LED Indicators

- 3.1. Unit: Power Status LED.
- 3.2. Per Port: Link Activity, Full-Duplex/Collision

5. Environmental

- 5.1. Operating temperature: from -40 to 167 F.
- 5.2. Operating humidity: from 5 percent to 90 percent (non condensing).
- 5.3. Storage temperature: from -40 to 185 F.

Power requirements

- 6.1. Input voltage: 10 to 30 VDC.

7. Physical characteristics

- 7.1. Housing: metal, IP30 protection rating.

86-2.XXC Construction

Install the ES as per the manufacturer's instructions and the plans.

86-2.XXD Payment

Not used.

Replace the 1st paragraph of section 86-3.02A(1) with:

This work includes installing a battery backup system. Comply with TEES.

Add to section 86-3.02A(2):

Submit the manufacturer's warranty documentation before installing the batteries.

Add to section 86-3.02A(3):

Batteries must have a 5-year manufacturer's warranty against defects in materials and workmanship. The warranty period starts on the date of Contract acceptance. Provide replacement batteries within 5 business days after notification of failed batteries. The Department pays to ship the failed batteries. Deliver replacement batteries to the District Maintenance Electrical Shop at:

175 West Cluster Street, San Bernardino, CA 92408

Add to section 86-3.02B:

The external cabinet must be capable of housing:

1. Eight (8) batteries
2. Inverter/charger unit
3. Power transfer relay
4. Manually-operated bypass switch
5. Required control panels
6. Wiring and harnesses

Add to section 86-3.04:

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

1. Service panel no. 1
2. Power distribution assembly no. 3
3. Input file (I file)
4. C1 harness
5. Controller and equipment shelves
6. Dual fan assembly with thermostatic control
7. Mechanical armature-type relays
8. Input panel

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

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

Each power distribution assembly must include the following equipment:

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

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

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

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

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

Add after section 86-3:04

86-3.06 LONG TERM EVOLUTION MODEM

86-3.06A General

86-3.06A(1) Summary

Section 86-3.06 contains specifications for installing long term evolution (LTE) wireless modem.

LTE is a standard for wireless data communications technology and an evolution of the GSM/UMTS standards.

86-3.06A(2) Definition

DHCP: Dynamic Host Configuration Protocol

PS: Global Positioning System

EDGE: Enhanced Data Rate for GSM Evolution

EV-DO: Evolution-Data Optimized

EVDO: Evolution Data Only

GPRS: General Packet Radio Service

GSM: Global System for Mobile Communications

HSPA: High-Speed Packet Access

HTTP: Hypertext Transfer Protocol

HTTPS: Hypertext Transfer Protocol Secure

IEC: International Electro technical Commission

SMA: SubMiniature Version A connector

SSH: Secure Shell

TCP: Transmission Control Protocol

UDP: User Datagram Protocol

USB: Universal Serial Bus

VPN: Virtual Private Network

86-3.06A(3) Submittals

Submit warranty documentation as an informational submittal before installation.

86-3.06A(4) Quality Control and Assurance

86-3.06A(4)(a) Acceptance testing

Two weeks prior to the traffic signal turn-on, deliver the LTE assembly to the Department. They will perform a loop back test at the installation site. The test will be for a period of not less than 5 days with continuous, satisfactory operation.

86-3.06A(4)(b) Warranty

Furnish a 2-year replacement warranty from the manufacturer of the modem and power supply against any defects or failures. The effective date of the warranty is the date of successful completion of acceptance testing.

86-3.06B Materials

The LTE wireless modem assembly consists of a modem, power supply, mounting bracket, hardware, serial communication cable, and antenna.

86-3.06B(1) Modem

The modem must:

1. Weigh less than 2 lb and have overall dimensions of less than 8 by 4 by 2 inches. The housing must be constructed of anodized aluminum.
2. Have the following status indicators:
 - 2.1. Power on
 - 2.2. Channel acquired
 - 2.3. Link status
 - 2.4. Network registration
 - 2.5. Received signal strength indicator
 - 2.6. Transmit and receive data
3. Meet the operational parameters shown in the following table:

Frequency Band
700 MHz (Optional)
800/1900 MHz

4. Have the following standard interfaces:
 - 4.1. TCP/IP, UDP/IP, DHCP, HTTP, SNMP.
 - 4.2. Device manager software for configuration and access
5. Have the following hardware interfaces:
 - 5.1 SMA antenna connector (RF)

- 5.2 Ethernet: 10/100 base-T Ethernet
- 5.3 TIA-232 serial port

The Contractor must provide the LTE modem to the Engineer a minimum of 10 days before the Contractor picks up the Model 332L cabinet.

The modem and associated firmware, software, hardware, protocol, and other features must be fully compatible with the existing Verizon wireless cellular network.

86-3.06B(2) Power Supply

The power supply must:

1. Have provisions to attach the modem power cable securely without modifying the cable.
2. Meet the requirements shown in the following table:

Characteristics	Requirements
Power cord	Standard 120 V(ac), 3 prong cord, at least 3 feet long
Operating temperature range	-22 to 158°F
Storage temperature	-40 to 185°F
Operating humidity range	5 to 95 percent non-condensing
Input voltage	10 to 28 V(dc)
Input current	40 to 200mA
Safety standards	UL 1012, UL 60950
Typical receive	200 mA at 12V(dc)
Typical transmit	Approximately 200 mA at 12V(dc)
Doormat connection (idle for 10-20 seconds)	40 mA at 12V(dc)

86-3.06B(2) Mounting Bracket and Hardware

The mounting bracket must:

1. Be stainless steel.
2. Securely hold the modem in a vertical position with all cables and conductors installed.
3. Contain a modem support fixture that allows the removal of the modem without tools or without removing the bracket from its attachment to the cabinet frame.
4. Be vertically mountable on a 19-inch standard rack rail using two machine screws and two wing nuts.

86-3.06B(3) Communication Cables

Provide the Cat 6 ethernet patch cable with minimum length of 6 feet and the C2 cable which interfaces the controller's C2 connector and the LTE modem including all conductors and connectors required for that purpose. The LTE modem connector must comply with TIA-232 standard using a 9-pin Type D connector. Controller end connector for the Department-furnished Model 170E/2070L must comply with AMP 201360-2 or equivalent. All pins in both connectors must be gold plated. The cable must be at least 3 feet long. The cable wiring must comply with the following:

DB9M (to external modem)		C2P (to Model 2070L controller)	
Function (DB9M)	Pin	Pin	Function (C2P)
Transmit Data	3	K	Data In
Receive Data	2	L	Data Out
Signal Ground	5	N	Ground
Request to Send	7	J	Request to send
Clear to Send	8	M	Clear to Send
Data Terminal Ready	4	H	Clear Detect

86-3.06B(4) Antenna

LTE modem must have SMA external antenna connectors-male (plug) type and SMA antenna connectors-female (socket) type.

SMA antennas must support 1 dBi gain (700 or 850 MHz bands) and 2 dBi (1900 MHz Bands) gain with a single or multi antenna configuration. Indoor type of SMA antenna is to be installed.

86-3.06C Construction

Install the modem as per the manufacturer's instructions and the plans.

86-3.06D Payment

Not used.

Replace section 86-4.01D(1)(c)(ii) with:

86-4.01D(1)(c)(ii) Warranty

The manufacturer must provide a written warranty against defects in materials and workmanship for LED signal modules for a minimum period of 48 months after installation of LED signal modules. Replacement LED signal modules must be provided within 15 days after receipt of failed LED modules at your expense. The Department pays for shipping the failed modules to you. All warranty documentation must be submitted to the Engineer before installation. Replacement LED signal modules must be delivered to State Maintenance Electrical Shop at 175 West Cluster Street, San Bernardino, CA 92408.

Add to section 86-4.01D(2)(a):

LED signal module must be manufactured for 12-inch circular and 8-inch circular sections.

Replace section 86-4.03H with:

86-4.03H LED Countdown Pedestrian Signal Face Modules**86-4.03H(1) General****86-4.03H(1)(a) Summary**

Section 86-4.03H includes specifications for installing a LED countdown PSF module into a standard Type A pedestrian signal housing. Comply with TEES.

86-4.03H(1)(b) Definitions

Not Used

86-4.03H(1)(c) Submittals

Before shipping LED countdown PSF modules to the job site, submit all modules and the following items to METS:

1. Delivery form with Contract number and contact information
2. Installation manual and schematic wiring diagram
3. Product information, including manufacturer's name and month and year of manufacture
4. List of model, lot, and serial numbers

Submit documentation of the manufacturer's production QA, including test data showing the modules comply with the following requirements:

1. Luminous intensity as shown in the table titled "Luminance Values."
2. Power factor after burn-in.
3. Test current flow measurements in amperes after burn-in. The measured values must comply with the design qualification figures. Record the measured ampere values with rated voltage on the product labels.

Submit the manufacturer's warranty before installing LED countdown PSF modules.

86-4.03H(1)(d) Quality Control and Assurance

86-4.03H(1)(d)(i) General

The Engineer rejects a module if a visual inspection reveals any of the following defects:

1. Exterior physical damage
2. Assembly anomalies
3. Scratches
4. Abrasions
5. Cracks
6. Chips
7. Discoloration
8. Other surface defects

The Department tests LED countdown PSF modules under ANSI/ASQ Z1.4 and California Test 606. The module submitted for testing must be representative of typical production units.

Comply with testing requirements for electrical material and equipment under section 86-2.14.

86-4.03H(1)(d)(ii) Warranty

Provide a 5-year manufacturer's replacement warranty against defects or failures. The warranty period starts on the date of Contract acceptance. Furnish replacement parts within 15 days after notification of a failed module. The Department does not pay for replacement modules. Deliver replacement modules to the Department's Maintenance Electrical Shop at:

86-4.03H(2) Materials

A LED countdown PSF module must:

1. Use LED as the light source.
2. Be made of material complying with ASTM D 3935.
3. Be designed to mount behind or to replace face plates of a standard Type A housing as specified in the ITE publication *Equipment and Material Standards*, chapter 3, "Pedestrian Traffic Control Signal Indications," and the *California MUTCD*.
4. Have a minimum power consumption of 10 W for the "Upraised Hand."
5. Have internal components supported such that they withstand mechanical shock and vibration from high winds and other sources.
6. Use the required color and be the ultra-bright type rated for 100,000 hours of continuous operation for a temperature range from -40 to +74 degrees C.
7. Have replaceable signal lamp optical units.
8. Fit into the housing of a pedestrian signal section without modification.
9. Be a single, self-contained device that does not require on-site assembly for installation.
10. Have the following information permanently marked on the back of the module:
 - 10.1. Manufacturer's name
 - 10.2. Trademark
 - 10.3. Model number
 - 10.4. Serial number
 - 10.5. Lot number
 - 10.6. Month and year of manufacture
 - 10.7. Required operating characteristics, including:
 - 10.7.1. Rated voltage
 - 10.7.2. Power consumption
 - 10.7.3. Volt-ampere
 - 10.7.4. Power factor
11. Have prominent and permanent vertical markings for accurate indexing and orientation within the 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."

The circuit board and the power supply must be contained inside of the LED countdown PSF module. The circuit board must comply with TEES, chapter 1, section 6.

The enclosure containing the power supply or the electronic components of the module, except the lens, must be made of UL 94 V-0 flame-retardant material.

Each symbol must be at least 9 inches high and 5-1/4 inches wide. The lens' signal output for the "Walking Person" and "Upraised Hand" symbols and the countdown display must not exceed a ratio of 5 to 1 for the highest and lowest luminance values. The symbols must comply with ITE publication *Equipment and Material Standards*, chapter 3, "Pedestrian Traffic Control Signal Indications," and the *California MUTCD*. 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 maintain an average luminance value for at least 5 years of continuous signal operation for a temperature range from -40 to +74 degrees C.

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	1,094 fL
"Walking Person"	1,547 fL

The color output of the module must comply with chromaticity requirements in section 5.3 of ITE publication *Equipment and Material Standards* chapter 3, "Pedestrian Traffic Control Signal Indications."

When operating over a temperature range from -40 to +74 degrees C, the measured chromaticity coordinates of the module must comply with the following requirements for 5 years after Contract acceptance:

Chromaticity Standards (CIE Chart)

"Upraised Hand" and 2-digit countdown timer (portland orange)	$0.600 \leq X \leq 0.659$ Y: Not greater than 0.390 or less than 0.331 or less than $0.990 - X$
"Walking Person" (lunar white)	X: Not less than 0.280 or greater than 0.400 Y: Not less than $0.0483 + 0.7917 * X$ or greater than $0.0983 + 0.7917 * X$

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
"Upraised Hand"	10.0 W	12.0 W
"Walking Person"	9.0 W	12.0 W
2-digit countdown timer	6.0 W	8.0 W

The wiring and terminal block must comply with section 13.02 of ITE publication *Equipment and Material Standards*, chapter 2, "Vehicle Traffic Control Signal Heads." The PSF module must have spade lugs and 3 secured, jacketed copper wires that comply with NEC and are:

1. Color coded
2. 3 feet long
3. 600 V(ac)
4. 20 AWG minimum stranded
5. Rated for service at +105 degrees C

The module must operate:

1. At a frequency of 60 ± 3 Hz over a voltage range from 95 to 135 V(ac) without flicker perceptible to the unaided eye. Fluctuations of the line voltage must have no visible effect on the luminous intensity of the indications. The rated voltage for measurements must be 120 V(ac).
2. With currently-used Department controller assemblies, including solid-state load switches, flashers, and conflict monitors. Comply with TEES, chapters 3 and 6. If an alternating current of 20 mA or less is applied to the unit, the voltage read across the 2 leads must not exceed 15 V(ac).
3. With a smart control and regulation mode that exhibits countdown displays automatically adjusted to the traffic controller's programmed intervals.

The countdown PSF module must operate during the pedestrian change interval. The module must begin counting down when the flashing "Upraised Hand" interval turns on, counting down to 0 and turning off when the steady "Upraised Hand" interval turns on.

The module's on-board circuitry must:

1. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS, section 2.1.6.
2. Comply with Class A emission limits for electronic noise under 47 CFR 15, subpart B.

The module must provide a power factor of 0.90 or greater.

The total harmonic distortion from a current and voltage induced in an alternating-current power line by a PSF module must not exceed 20 percent at an operating temperature of 25 degrees C.

The module's circuitry must prevent light emission perceptible to the unaided eye when a voltage of 50 V(ac) or less is applied to the unit.

When power is applied to the module, light emission must occur within 90 ms.

86-4.03H(3) Construction

Use LED countdown PSF modules from the same manufacturer.

Install the module in a standard Type A pedestrian signal housing. Special tools must not be required for installing the modules.

The installation of the module into the pedestrian signal face must require only the removal of the lens, reflector, and existing LED module.

86-4.03H(4) Payment

Not Used

Add to section 86-4.03I(1)(b):

Submit warranty documentation as an informational submittal before installing LED PSF modules.

Replace section 86-4.03I(1)(c)(ii) with:

86-4.03I(1)(c)(ii) Warranty

Submit a 5-year manufacturer's warranty against defects in materials and workmanship for LED PSF modules. The 5-year warranty period starts on the date of Contract acceptance. Furnish replacement modules within 15 days after receiving the failed modules. The Department does not pay for replacement modules. Deliver replacement modules to the Department's Maintenance Electrical Shop at:

175 West Cluster Street, San Bernardino, CA 92408

Add to the 6th paragraph in section 86-4.03I(2):

Installation of the LED PSF module into the pedestrian signal face only requires the removal of lenses, reflectors, and existing LED modules.

Add to section 86-4:

86-4.06 LIGHT EMITTING DIODE METER ON SIGN

86-4.06A General

86-4.06A(1) Summary

Section 86-4.03J includes specifications for installing LED meter-on in type A modified pedestrian signal.

Comply with section 86-4.03.

86-4.06A(2) Submittals

Before shipping LED signal modules to job site, submit to METS:

1. Delivery form including district number, EA, and contact information
2. List containing all LED signal module serial numbers anticipated for use
3. LED signal modules

Submit warranty documentation before installation.

86-4.06A(3) Quality Control and Assurance

86-4.06A(3)(a) General

Module must be one listed on the Pre-Qualified Products List for LED traffic signals at:

http://www.dot.ca.gov/hq/esc/approved_products_list

The Department will test LED signal module shipments per Normal Sampling Plan ANSI/ASQC Z1.4, Tables for Inspection by Attributes. The Department completes testing within 30 days after delivery to METS. LED signal modules tested or submitted for testing must be representative of typical production units. LED signal modules will be tested under California Test 604. All parameters of the specification may be tested on the modules. LEDs must be spread evenly across the module. Measurements will be performed at the rated operating voltage of 120 V (ac).

After testing, pick up accepted LED signal modules from METS and deliver to the job site.

86-4.06A(3)(b) Warranty

Furnish a 4-year replacement warranty from the manufacturer of the LED signal modules against any defects or failures. The effective date of the warranty is the date of installation. Furnish replacement components within 15 days after receipt of the failed parts. The Department does not pay for the replacement. Deliver replacement LED signal modules to the following department maintenance electrical shop:

District 8 - Caltrans Electrical Maintenance Yard
175 West Cluster Street
San Bernardino, CA 92408

86-4.06B Materials

LED Meter on module must:

1. Be weather tight and connect directly to electrical wiring.
2. Be capable of optical unit replacement.
3. Be AlInGaP technology
4. Be ultra bright type rated for 100,000 hours of continuous operation from -40 to +74 degrees C
5. Each module must provide an average luminous intensity of 1,547 foot-lambert or more throughout the useful life over the operating temperature range.
6. The uniformity ratio of an illuminated symbol must not exceed 4 to 1 between the highest luminance area and the lowest luminance area in the module.
7. The color output of the module must comply with the requirements of Section 5.3 in the ITE Publication: Equipment and Material Standards, Chapter 3 (Pedestrian Traffic Control Signal Indications).
8. 'Meter On' must be lunar white with measured chromatical coordinates of LED module operating over a temperature range of -40 to +74 degrees C is:
 - x: not less than 0.280, nor greater than 0.320
 - y: not less than 1.055X - 0.0128, nor greater than 1.055X +0.0072
9. Be a single, self-contained device, not requiring on-site assembly for installation into standard Type A housing.
10. Module Identification
 - 10.1. Each module must have the manufacturer's name, trademark, model number, serial number, date of manufacture month and year, and lot number as identification permanently marked on the back of the module.
 - 10.2. The following operating characteristics must be permanently marked on the back of the module: rated voltage and rated power in Watts and Volt-Ampere.
11. Maximum power consumption requirements for the LED modules in Watts are:
 - 13.1. 15.0 at 25 degrees C.
 - 13.2. 17.0 at 74 degrees C.

LED Meter on modules must have an operational lifecycle rating of 48 months. During the operational lifecycle, LED signal modules must meet all parameters of this specification.

Individual LEDs must be wired such that a catastrophic loss or failure of one LED will result in loss of not more than 5 percent of the module light output. Failure of an individual LED in a string must not result in the loss of entire string or other indication.

Wiring and terminal block must comply with Section 13.02 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads." The LED module must be supplied with spade lugs and 3 secured, color-coded, 3-foot long, 600 V, 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 degrees C.

LED Meter on module must operate:

1. At a frequency of 60 ± 3 Hz, over a voltage range from 95 to 135 V (ac), without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on luminous intensity of the indications. Rated voltage for measurements must be 120 V (ac).
2. Compatible with currently used State controller assemblies, including solid state load switches, flashers, and conflict monitors. Comply with TEES Chapters 3 and 6. If a 20 mA alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V (ac) or less.

LED Meter on module on-board circuitry must:

1. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, Section 2.1.6.
2. Comply with FCC, Title 47, SubPart B, Section 15 regulations for Class A emission limits for electronic noise.

LED signal module must provide a power factor of 0.90 or greater.

Total harmonic distortion from current and voltage induced into an alternating current power line by LED signal module must not exceed 20 percent at an operating temperature of 25 degrees C.

When power is applied to LED signal module, light emission must occur within 90 ms.

Power supply must be integral to the module.

Internal components must be adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Lens and LED signal module material must comply with the ASTM specifications for that material.

Enclosures containing either the power supply or electronic components of LED signal module, except lenses, must be made of UL94VO flame-retardant material.

LED signal module must have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing. Markings must include an up arrow, or the word "UP" or "TOP."

Lenses must have 3/16 inch, minimum thickness, clear acrylic or polycarbonate plastic or 1/8 inch nominal thickness glass fiber reinforced plastic with molded one piece neoprene gasket. Message lettering for "METER" must be "Series C," 4-1/2 inches high with uniform 1/2 inch stroke, and for "ON" must be "Series C," 6 inches high, with uniform one inch stroke. Letters must be clear, transparent or translucent, with black opaque background silk screened on to the second surface of the lens.

86-4.06C Construction

No special tools for installation are allowed.

Add to section 86-5.01A(1):

Loop wire must be Type 2.

Loop detector lead-in cable must be Type B.

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

For Type E detector loops, sides of the slot must be vertical and the minimum radius of the slot entering and leaving the circular part of the loop must be 1-1/2 inches. Slot width must be a maximum of 5/8 inch. Loop wire for circular loops must be Type 2. Slots of circular loops must be filled with hot-melt rubberized asphalt sealant.

The depth of the loop sealant above the top of the uppermost loop wire in the sawed slots must be 2 inches, minimum.

Replace "Reserved" in section 86-5.01C with:

This work consists of furnishing and installing a microwave vehicle detection system (MVDS).

86-5.01C(1) Materials List and Drawings

A list of materials that the Contractor proposes to install for the MVDS, together with the drawings and other data, must be submitted under section 86-1.04. Additionally, the following must be provided before the completion of the Contract:

1. Certificate of Compliance - Submit a certificate of compliance for MVDS.
2. Site Analysis Report - Prior to MVDS installation, the Contractor must review each detection site and provide a written analysis recommending the optimum sensor placement for complying with the performance requirements of this special provision. The analysis must be reviewed and approved by the MVDS manufacturer.
3. Lane Configuration - The documentation must include a diagram that illustrates how the microwave beam is covering the traffic lanes as well as the MVDS connector pins or wire terminals that correspond to the respective lanes. The lanes must be identified by direction (i.e., NB, SB, EB, WB) and in order with lane one being the lane nearest to the center of the roadway.
4. Mounting and Wiring Information - The Contractor must provide to the Engineer for authorization 1 set of detailed diagrams showing wiring and service connections for each MVDS. The authorized diagrams must be covered separately on each side with clear self-adhesive plastic and placed in a heavy-duty plastic envelope. The envelope must be attached securely to the inside of the cabinet door or at a location ordered.
5. Communication Protocol - The MVDS communication protocol must be open and must be freely available for use in the public domain. The Contractor must provide documentation that defines the complete MVDS communication protocol. The documentation consists of a message structure organization, data packet length, and all information necessary to make use of the messages.
6. Remote Programming - The Contractor must provide all information and software necessary for operating the system from a remote Windows 2000/NT-based or newer PC. This information and software must include at a minimum the capability to calibrate, tune, align, and program the MVDS and be provided on a CD compatible with Windows 2000/NT-based or newer PC. The information must be formatted such that the files can be matched with the equipment being calibrated or aligned. This documentation must contain files that allow for replacement equipment to be loaded with the same configuration.
7. MVDS Accuracy Analysis - The Contractor must be responsible for conducting MVDS Performance Testing and must submit an MVDS accuracy analysis that complies with the requirements of the special provisions within 15 days of MVDS testing. The original video recordings as well as DVD or CD copies of the video images covering the analysis periods must be included.
8. Acceptance Testing Documentation - The Contractor must provide a test plan including the time and the period of the testing to be authorized. The test plan must be organized to allow the Engineer to perform acceptance testing by using the documentation and without assistance from the Contractor. The Contractor must collect and submit the data to be certified. If requested, the data must be collected in the presence of the Engineer.
9. Acceptance Testing Schedule - The Contractor must submit a testing schedule for authorization 15 days prior to acceptance testing of the MVDS. If the testing period extends beyond the normal working shift or if the Contractor fails to provide the necessary material for the testing within 1 hour of the scheduled testing start time, the Engineer may cancel the testing for the day.
10. Training - The Contractor must provide a copy of the training material for authorization 30 days prior to the training. The content of the training must include instruction on how to align, program, adjust, calibrate, and maintain the MVDS.

86-5.01C(2) Functional Requirements

MVDSs must simultaneously provide vehicle detection data in the form of vehicle presence, volumes, counts, speed, classification, and occupancy for a minimum of 8 lanes of traffic and must comply with the performance requirements of the special provisions. MVDSs must provide a separate zone per lane and detect vehicles as close as 9.8 feet and as far as 197 feet from the MVDS sensor. MVDSs must monitor traffic lanes in the presence of barrier railings, guard railings, and other obstacles.

MVDSs must comply with the following detection performance criteria when installed at a minimum of 9.8 feet from the nearest lane and at a minimum height of 16.4 feet above the roadway detection zone:

1. Average 5-minute volumes for all lanes combined with better than 95-percent accuracy compared to vehicles observed in video images for the same period for any 15-minute period selected by the Engineer.
2. Average 30-second volumes in every lane with better than 90-percent accuracy compared to vehicles observed in video images for the same period for any 5-minute period selected by the Engineer.
3. Average 30-second speed in any lane with better than 95-percent accuracy for any 5-minute period selected by the Engineer.
4. Average 5-minute occupancy for any lane with better than 85-percent accuracy for any 15-minute period selected by the Engineer.
5. Count accuracy, when compared to vehicles observed in video images for the same period, must be not less than 90 percent for any lane and not less than 95 percent for all lanes combined.
6. Average 15-minute classification according to user-defined criteria with better than 90-percent accuracy compared to vehicles observed in video images for the same period. Vehicle or length classification must be provided for categories of small car, average car, mid size car, long car, and extra-long car that are user definable by either length parameters, minimum length to maximum length for the category, or by a multiple of length of the average car.
7. The Contractor must provide the criteria for speed and volume acceptance testing for authorization. The Contractor must also provide speed and volume data for verification by the Engineer.

MVDS must consist of a sensor unit and include all required mounting hardware, power supplies, surge suppression, cables, connectors, and wiring. The MVDS sensor must include, as a minimum, a directional microwave transmitter, antenna, microwave receiver, processor, memory, and communication interface.

The MVDS must have an EIA-RS232, EIA-485, or Ethernet communication port that supports the National Transportation Communication for ITS Protocol (NTCIP). The MVDS communication protocol must be nonproprietary and openly specified and available for use in the public domain. The MVDS must be addressable and must download count, speed, and occupancy data when polled by the traffic management center computer. Speed must be configurable in U.S. customary or metric units. The MVDS must support unit setup from a serial console port on the MVDS unit. The console port protocol must support sensor unit setup from a local Windows 2000/NT or newer compatible laptop or from a remote location with a desktop computer and standard phone modem.

When MVDS sensor contact outputs will be connected to Model 170E/2070 controller to emulate inductive loops, comply with the following:

1. The MVDS sensors must be connected to a microwave sensor interface card (MSIF) installed in the input file of a Department-furnished Model 170E or Model 2070 controller cabinet.
2. Each detection zone must provide an optically isolated relay contact pair that follows the presence of vehicles in every traffic lane and sends signals to the controller with the accuracy stated in the special provisions.
3. The MSIF must have indications for power, communication, and the real-time operation of each detection contact output.

MVDSs must be user programmable in the field via the MVDS unit console port with a Windows 2000/NT or newer compatible laptop computer. The Contractor must provide software, firmware, and equipment to set up, calibrate, and operate the unit. MVDS software must observe the vehicular traffic and automatically place detection lanes and set the sensor sensitivity. MVDSs must be designed such that a trained Department employee can configure and calibrate the MVDS in less than 15 minutes per lane once the MVDS sensor unit is installed.

86-5.01C(3) Technical Requirements

MVDSs must be FCC certified under 47 CFR 15 for low power, unlicensed, continuous radio transmitter operation. The MVDS must comply with FCC regulations for all specified operating conditions and over the expected life of the MVDS.

MVDS sensor unit must not weigh more than 11 pounds. The MVDS must operate over a temperature range from -30 degrees C to +70 degrees C, with up to 95 percent relative humidity. The MVDS sensor

enclosure must be weatherproof with a NEMA 3R rating and the sensor mounted and directed perpendicular to the flow of traffic lanes at the locations shown.

All electronic assemblies must comply with the specifications in chapters 1 and 5 of the TEES.

The MSIF must be inserted into the controller input file slots using the edge connector to obtain limited 24 V(dc) power and to provide contact closure outputs. No rewiring to the Model 170E or Model 2070 cabinet must be allowed. The MSIF must comply with the specifications in chapter 1 as well as sections 5.2.8, 5.2.8.1, 5.2.8.2, 5.4.1, 5.4.5, 5.4.5, and 5.4.6, 5.5.1, 5.5.5, and 5.5.6 of TEES.

MVDS sensors must be wired with a connectorized cable harness. Cables must run continuously without splices between the sensor and controller cabinet and terminate in labeled terminal blocks identified with the purpose served. The connector must be a standard mil type and rated plug. The cable must have the number of conductors specified by the MVDS manufacturer to support the number of detection zones shown plus spares for 2 future zones with an overall shield and copper drain wire. Conductors must be stranded copper equal to or exceeding the minimum strands and wire dimensions specified by the MVDS manufacturer for the wiring distance involved and covered with a minimum 12 mils polyvinyl chloride (PVC) insulation rated for 300 V at 105 degrees C. The outer jacket must be chrome PVC with minimum thickness of 53 mils and the outside diameter of the cable must not exceed 3/4 inch. A minimum of 6.5-foot slack of MVDS cable must be coiled at the bottom of the controller cabinet. Slack in other cabinets must be as shown or as ordered.

MVDS sensor unit power supplies or transformers must be vertically mounted on a standard DIN-rail rack using standard mounting hardware. The Contractor must wire the MVDS power conductors to DIN-rail rack-mounted terminal blocks in the controller cabinet as ordered. The serial data communication output conductors must be terminated at TB-0 and continue for a minimum of 9.8 feet to a DB9F connector for setup and diagnostic access. The contact pair output conductors must be terminated at terminal block, TB-2. The ends of unused and spare conductors must be coiled and taped to prevent accidental contact to other circuits. Conductors inside the cabinet must be labeled for the functions as shown on the authorized detailed diagrams.

The power supply or transformer must comply with or exceed the following minimum requirements:

	Power supply	Transformer
Power cord	Standard 120V(ac), 3 prong cord, at least 40 inches in length (may be added by Contractor)	Standard 120V(ac), 3 prong cord, at least 40 inches in length (may be added by Contractor)
Type	Switching mode type	Class 2
Rated power	Twice (2x) full system load	Twice (2x) full system load
Operating temperature	From -35 °C to +74 °C	From -35 °C to +74 °C
Operating humidity range	From 5 percent to 95	From 5 percent to 95
Input voltage	From 90 V to 135 VAC	From 90V to 135 VAC
Input frequency	60 Hz +/- 1 Hz	60 Hz +/- 1 Hz
Inrush current	Cold start, 25 A max. at 115 V	N/A
Output voltage	As required by the MVDS	As required by the MVDS
Overload protection	From 105 percent to 150 percent in output pulsing mode	Power limited at >150 percent
Over voltage protection	From 115 percent to 135 percent of rated output voltage	N/A
Setup, rise, hold up	800ms, 50ms, 15ms at 115VAC	N/A
Withstand voltage	I/P-0/P:3kV, I/P-FG:1.5kV, for 60 sec.	I/P-0/P:3kV, I/P-FG:1.5kV, for 60 sec
Working temperature	Not to exceed 70 °C@30% load	Not to exceed 70 °C@30% load
Safety standards	UL 1012, TUV EN60950	UL 1585
EMC standards	EN55022 Class B, EN61000-4-2, 3, 4, 5 and EN61000-3-2, 3	N/A

Field terminated circuits must include transient protection that complies with IEEE Standard 587-1980 Category C.

The MVDS must automatically restore normal operation following a power failure within 3 minutes and not require manual intervention. The MVDS must maintain the configuration and calibration information in nonvolatile memory and retain the information while powered off for at least 90 days.

The MVDS must be configurable for 30-second to 24-hour polling cycles and store vehicle count, speed, classification, and occupancy data in 10-second to not less than 15-minute intervals.

The MVDS must be tested and in standard production for a minimum of 3 months. The Contractor must not install any MVDS older than 6 months from the scheduled start date of the MVDS installation as indicated by date codes or serial numbers of electronic circuit assemblies.

The MVDS system and all supporting equipment must be designed to operate continuously in an outdoor traffic monitoring and control environment. The Contractor must provide a manufacturer's warranty stating that the manufacturing quality and electronic components must support a "mean time between failure" of 10 years in this environment.

86-5.01C(4) Construction

The Contractor must assure that the MVDS will not cause harmful interference to radio communication in the area of the installation as required by 47 CFR 15. The MVDS units must be installed such that each unit operates independently and does not interfere with other MVDS units or other equipment in the vicinity.

The Contractor is responsible for site visits and analysis of each proposed pole location to assure that the detector placement will comply with the manufacturer's published installation instructions and the performance required in the special provisions. The Contractor must confirm detector placement with the manufacturer before performing work at the MVDS location. Whenever the manufacturer's analysis requires a change in the proposed pole location, the Contractor must arrange a meeting with the manufacturer and the Engineer to select a new pole location.

The Contractor must not proceed with any MVDS installation until the pole location is authorized.

The Contractor is responsible for the compatibility of components and for making necessary calibration adjustments to deliver the performance required in the special provisions. The Contractor must provide equipment required to set up, calibrate, verify performance, and maintain the MVDS.

The Contractor must provide programming software needed to support the MVDS. The software must be installed in the appropriate equipment and used for the acceptance testing.

86-5.01C(5) Testing

Accuracy of the MVDS system must be verified by comparing the MVDS vehicle counts to recorded video image counts for the same period. The video camera must be located and oriented so that traffic is visible in all lanes. Video images must be time stamped and analysis periods recorded to a DVD or CD media for viewing on a PC. The video field of view must totally encompass the area in which vehicles are detected. The Contractor must provide a means for synchronizing the test starting and ending times or provide software that displays time stamped MVDS data along with the video images of the moving vehicles. The Contractor must provide the Engineer with the original recording medium and documentation that supports the accuracy analysis and make a copy of these materials for its own use.

The accuracy test must take place during a complex traffic period as specified by the Engineer. The following video recording and analysis options that depend on the available traffic conditions are acceptable; however the heaviest expected traffic conditions should be used, if possible:

1. The minimum recording period must be 30 minutes when the recording includes congested traffic (vehicles traveling at less than 20 mph for five or more minutes in any lane).
2. The minimum recording period must be 45 minutes when the traffic flow exceeds 1500 vehicles per hour in any lane during the test period.
3. The minimum recording period must be 60 minutes when the flow is less than 1500 vehicles per hour in every lane.

The analysis must be based on a minimum of 100 detected vehicles in every lane and cover the same time period for all lanes. The time period within the selected video will be selected by the Engineer. The total vehicle count for every lane must be used and include the first and last partial vehicles for each lane.

Errors in the start and finish of the MVDS and manual counts are included in the performance criterion specified in the special provisions.

MVDS unit count must be compared to the vehicle counts under these traffic conditions. Vehicles licensed for use on State roads must be counted by the MVDS. The data accuracy must be determined by the formula $100\{1-[(TC-MC)/TC]\}$, where TC=traffic count derived from the media recording, MC=MVDS-reported count over the same period of time, and the resulting fraction is expressed as an absolute value.

The accuracy of each MVDS unit must be determined and documented so each unit may be authorized or rejected separately by the Engineer. Failure to submit the materials at the conclusion of testing invalidates the test. The recorded media serves as acceptance evidence and must not be used for calibration. The calibration must have been completed prior to testing and verification.

The Engineer will review the accuracy data findings and accept or reject the results within 15 days. Determination of vehicle anomalies or unusual occurrences will be decided by the Engineer. Data or counts that are not accepted by the Engineer must be considered errors and count against the MVDS unit's calibration. If the Engineer finds that the MVDS does not comply with the performance requirements, the Contractor must recalibrate and retest the unit and resubmit new test data within 10 days. Following 3 failed attempts, the Contractor must replace the MVDS detector with a new unit.

In addition to the accuracy analysis performed by the Contractor, the Contractor must provide equipment, software, documentation, support equipment, and any other materials, personnel, and devices that may be required for acceptance testing by the Engineer. The Contractor must notify the Engineer 15 days before the MVDS unit is ready for acceptance testing. Testing must be scheduled to be accomplished before the end of the normal work shift.

86-5.01C(6) Training

The Contractor must provide a minimum of 1 hours of training by a certified manufacturer's representative for up to 2 Department personnel selected by the Engineer. The content of the training must include instruction on how to align, program, adjust, calibrate, and maintain the MVDS. The Contractor must provide materials and equipment for the training. The Contractor must provide the Engineer 15 days notice prior to the training

86-5.01C(7) Payment

Not Used

Replace "Reserved" in section 86-5.01D with:

86-5.01D(1) General

Each traffic signal must have an emergency vehicle detector system that must comply with the details shown and the special provisions.

Each emergency vehicle detector system must consist of an optical emitter assembly or assemblies located on the appropriate vehicle and an optical detector/discriminator assembly or assemblies located at the traffic signal.

Emitter assemblies are not required for this project except units for testing purposes to demonstrate that the systems perform as specified. Tests must be conducted in the presence of the Engineer as described in section 86-5.01D(4) during the signal test period. The Engineer must be provided a minimum of 2 business days notice before performing the tests.

Each system must allow detection of 2 classes of authorized vehicles. Class I (mass transit) vehicles must be detected at ranges of up to 1,000 feet from the optical detector. Class II (emergency) vehicles must be detected at ranges up to 1,800 feet from the optical detector.

Class I signals (those emitted by Class I vehicles) must be distinguished from Class II signals (those emitted by Class II vehicles) on the basis of the modulation frequency of the light from the respective emitter. The modulation frequency for Class I signal emitters must be $9.639 \text{ Hz} \pm 0.110 \text{ Hz}$. The modulation frequency for Class II signal emitters must be $14.035 \text{ Hz} \pm 0.250 \text{ Hz}$.

A system must establish a priority of Class II vehicle signals over Class I vehicle signals and must comply with the requirements in section 25352 of the California Vehicle Code.

86-5.01D(2) Emitter Assembly

86-5.01D(2)(a) General

Each emitter assembly provided for testing purposes must consist of an emitter unit, an emitter control unit, and connecting cables.

Each emitter assembly, including lamp, must operate over an ambient temperature range of -34 to +60 degrees C at both modulation frequencies and operate continuously at the higher frequency for a minimum of 3,000 hours at 25 degrees C ambient temperature before failure of the lamp or other components.

Each emitter unit must be controlled by a single, maintained-contact switch on the respective emitter control unit. The switch must be located to be readily accessible to the vehicle driver. The control unit must contain a pilot light to indicate that the emitter power circuit is energized and must generate only 1 modulating code, either that for Class I vehicles or that for Class II vehicles.

86-5.01D(2)(b) Functional

Each emitter unit must transmit optical energy in 1 direction only.

The signal from each Class I signal emitter unit must be detectable at a distance of 1,000 feet when used with a standard optical detection/discriminator assembly and filter to eliminate visible light. Visible light must be considered eliminated when the output of the emitter unit with the filter is less than an average of 0.0003 candela per energy pulse in the wavelength range of 380 nm to 750 nm when measured at a distance of 10 feet. Submit a certificate of compliance for each Class I emitter unit.

The signal from each Class II signal emitter unit must be detectable at a distance of 1,800 feet when used with a standard optical detection/discriminator assembly.

The standard optical detection/discriminator assembly to be used in making the range tests must be available from the manufacturer of the system. A certified performance report must be furnished with each assembly.

86-5.01D(2)(c) Electrical

Each emitter assembly must provide full light output with input voltages of between 12.5 V (dc) and 17.5 V (dc). An emitter assembly must not be damaged by input voltages up to 7.5 V (dc) above supply

voltage. The emitter assembly must not generate voltage transients, on the input supply, that exceed the supply voltage by more than 4 volts.

Each emitter assembly must consume not more than 100 W at 17.5 V (dc) and must have a power input circuit breaker rated at 10 A to 12 A, 12 V (dc).

The design and circuitry of each emitter must allow its use on vehicles with either negative or positive ground without disassembling or rewiring of the unit.

86-5.01D(2)(d) Mechanical

Each emitter unit must be housed in a weatherproof corrosion-resistant housing. The housing must be provided with facilities to allow mounting on various types of vehicles and must have provision for aligning the emitter unit properly and for locking the emitter unit into this alignment.

Each emitter control unit must be provided with hardware to allow the unit to be mounted in or on an emergency vehicle or mass transit vehicle. Where required for certain emergency vehicles, the emitter control unit and exposed controls must be weatherproof.

86-5.01D(3) Optical Detection/Discriminator Assembly

86-5.01D(3)(a) General

Each optical detection/discriminator assembly must consist of 1 or more optical detectors, connecting cable and a discriminator module.

Each assembly, when used with standard emitters, must have a range of at least 1,000 feet for Class I signals and 1,800 feet for Class II signals. Standard emitters for both classes of signals must be available from the manufacturer of the system. Range measurements must be taken with all range adjustments on the discriminator module set to "maximum".

86-5.01D(3)(b) Optical Detector

Each optical detector must be a waterproof unit capable of receiving optical energy from 2 horizontal directions.

The reception angle for each photocell assembly must be a maximum of 8 degrees in all directions about the aiming axis of the assembly. Measurements of reception angle will be taken at a range of 1,000 feet for a Type I emitter and at a range of 1,800 feet for a Type II emitter.

Internal circuitry must be solid state and electrical power must be provided by the associated discriminator module.

Each optical detector must be contained in a housing, which must include 2 photocell assemblies, an electronic assembly and a base. The base must have an opening to allow mounting on a mast arm or a vertical pipe nipple, or suspension from a span wire. The mounting opening must have female threads for 3/4 inch conduit. A cable entrance must be provided which must have male threads and gasketing to allow a waterproof cable connection. Each detector must have weight of less than 2.5 pounds and must present a maximum wind load area of 36 square inches. The housing must be provided with weep holes to allow drainage of condensed moisture.

Each optical detector must be installed, wired and aimed as specified by the manufacturer.

86-5.01D(3)(c) Cable

Optical detector cable (EV-C) must comply with the requirements of IPCEA-S-61-402/NEMA WC 5, section 7.4, 600-V (ac) control cable, 75 degrees C, Type B, and the following:

1. The cable must contain 3 conductors, each of which must be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation. Minimum average insulation thickness must be 25 mils. Insulation of individual conductors must be color coded: 1-yellow, 1-blue, 1-orange.
2. The shield must be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire must be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
3. The jacket must be black polyvinyl chloride with minimum ratings of 600 V (ac) and 80 degrees C and a minimum average thickness of 43 mils. The jacket must be marked as required by IPCEA/NEMA.

4. The finished outside diameter of the cable must not exceed 0.35-inch.
5. The capacitance, as measured between any conductor and the other conductors and the shield, must not exceed 48 pf per foot at 1000 Hz.
6. The cable run between each detector and the controller cabinet must be continuous without splices or must be spliced only as directed by the detector manufacturer.

86-5.01D(3)(d) Discriminator Module

Each discriminator module must be designed to be compatible and usable with a Model 170E/2070E controller unit and to be mounted in the input file of a Model 332L or Model 336L controller cabinet, and must comply with the requirements in chapter 1 of TEES.

Each discriminator module must be capable of operating 2 channels, each of which must provide an independent output for each separate input.

Each discriminator module, when used with its associated detectors, must perform the following:

1. Receive Class I signals at a range of up to 1,000 feet and Class II signals at a range of up to 1,800 feet.
2. Decode the signals, on the basis of frequency, at $9.639 \text{ Hz} \pm 0.119 \text{ Hz}$ for Class I signals and $14.035 \text{ Hz} \pm 0.255 \text{ Hz}$ for Class II signals.
3. Establish the validity of received signals on the basis of frequency and length of time received. A signal must be considered valid only when received for more than 0.50-second. No combination of Class I signals must be recognized as a Class II signal regardless of the number of signals being received, up to a maximum of 10 signals. Once a valid signal has been recognized, the effect must be held by the module in the event of temporary loss of the signal for a period adjustable from 4.5 seconds to 11 seconds in at least 2 steps at 5 seconds ± 0.5 second and 10 seconds ± 0.5 second.
4. Provide an output for each channel that will result in a "low" or grounded condition of the appropriate input of a Model 170E controller unit. For Class I signals the output must be a $6.25 \text{ Hz} \pm 0.1$ percent, rectangular waveform with a 50 percent duty cycle. For Class II signals the output must be steady.

Each discriminator module must receive electric power from the controller cabinet at either 24 V (dc) or 120 V (ac).

Each channel together with the channel's associated detectors must draw not more than 100 mA at 24 V (dc) or more than 100 mA at 120 V (ac). Electric power, 1 detector input for each channel and 1 output for each channel must terminate at the printed circuit board edge connector pins shown in the following table:

Board Edge Connector Pin Assignment

A	DC ground		
B	+24 V (dc)	P	(NC)
C	(NC)		
D	Detector input, Channel A	R	(NC)
E	+24V (dc) to detectors	S	(NC)
F	Channel A output (C)	T	(NC)
		U	(NC)
H	Channel A output (E)	V	(NC)
J	Detector input, Channel B	W	Channel B output (C)
K	DC ground to detectors	X	Channel B output (E)
L	Chassis ground	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

(C) Collector, slotted for keying

(E) Emitter, slotted for keying

(NC) Not connected, cannot be used by manufacturer for any purpose.

Two auxiliary inputs for each channel must enter each module through the front panel connector. Pin assignment for the connector must be as follows:

1. Auxiliary detector 1 input, Channel A
2. Auxiliary detector 2 input, Channel A
3. Auxiliary detector 1 input, Channel B
4. Auxiliary detector 2 input, Channel B

Each channel output must be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V (ac) and must be compatible with the Model 170E controller unit inputs.

Each discriminator module must be provided with means of preventing transients received by the detector from affecting the Model 170E/2070E controller assembly.

Each discriminator module must have a single connector board and must occupy 1 slot width of the input file. The front panel of each module must have a handle to facilitate withdrawal and the following controls and indicators for each channel:

1. Three separate range adjustments each for both Class I and Class II signals.
2. A 3-position, center-off, momentary contact switch, 1 position (down) labeled for test operation of Class I signals, and 1 position (up) labeled for test operation of Class II signals.
3. A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indication denotes that a signal above the threshold level has been received. A "call" indication denotes that a steady, validly coded signal has been received. These 2 indications may be accomplished with a single indication lamp; "signal" being denoted by a flashing indication and "call" with a steady indication.

In addition, the front panel must be provided with a single circular, bayonet-captured, multi-pin connector for 2 auxiliary detector inputs for each channel. Connector must be a mechanical configuration complying with the requirements in Military Specification MIL-C-26482 with 10-4 insert arrangement, consisting of the following:

1. Wall mounting receptacle, with gold plated pins.
2. Plug with gold plated sockets, cable clamp and strain relief that must provide for a right angle turn within 2-1/2 inches maximum from the front panel surface of the discriminator module.

86-5.01D(3)(e) Cabinet Wiring

The Model 332L cabinet has provisions for connections between the optical detectors, the discriminator module and the Model 170E/2070E controller unit.

Wiring for a Model 332L cabinet must comply with the following:

1. Slots 12 and 13 of input file "J" have each been wired to accept a 2-channel module.
2. Field wiring for the primary detectors, except 24-V (dc) power, must terminate on either terminal board TB-9 in the controller cabinet or on the rear of input file "J," depending on cabinet configuration. Where TB-9 is used, position assignments must be as shown in the following table:

Position	Assignment
4	Channel A detector input, 1st module (Slot J-12)
5	Channel B detector input, 1st module (Slot J-12)
7	Channel A detector input, 2nd module (Slot J-13)
8	Channel B detector input, 2nd module (Slot J-13)

The 24-V (dc) cabinet power will be available at Position 1 of terminal board TB-1 in the controller cabinet.

Field wiring for the auxiliary detectors must terminate on terminal board TB-O in the controller cabinet. Position assignments are as shown in the following table:

For module 1 (J-12)		For module 2 (J-13)	
Position	Assignment	Position	Assignment
1	+24V (dc) from (J-12E)	7	+24V (dc) from (J-13E)
2	Detector ground From (J-12K)	8	Detector ground from (J-13K)
3	Channel A auxiliary detector input 1	9	Channel A auxiliary detector input 1
4	Channel A auxiliary detector input 2	10	Channel A auxiliary detector input 2
5	Channel B auxiliary detector input 1	11	Channel B auxiliary detector input 1
6	Channel B auxiliary detector input 2	12	Channel B auxiliary detector input 2

86-5.01D(4) System Operation

The Contractor must demonstrate that the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance must be determined using the following test procedure during the functional test period:

1. Each system to be used for testing must consist of an optical emitter assembly, an optical detector, an optical detector cable and a discriminator module.
2. The discriminator modules must be installed in the proper input file slot of the Model 170E/2070E controller assembly.
3. Two tests must be conducted: 1 using a Class I signal emitter and a distance of 1,000 feet between the emitter and the detector, the other using a Class II signal emitter and a distance of 1,800 feet between the emitter and the detector. Range adjustments on the module must be set to "Maximum" for each test.
4. Each test must be conducted for a period of 1 hour, during which the emitter must be operated for 30 cycles, each consisting of a 1 minute "on" interval and a 1 minute "off" interval. During the total test period, the emitter signal must cause the proper response from the Model 170E controller unit during each "on" interval and there must be no improper operation of either the Model 170E/2070E controller unit or the monitor during each "off" interval.

Replace "Reserved" in section 86-5.03 of the RSS with:

86-5.03A General

86-5.03A(1) Summary

Section 86-5.03 includes specifications for installing accessible pedestrian signals (APS). Comply with TEES.

86-5.03A(2) Definitions

accessible pedestrian signal: Accessible pedestrian signal as defined in the *California MUTCD*.

accessible walk indication: Activated audible and vibrotactile action during the walk interval.

ambient sound level: Background sound level in dB at a given location.

ambient sound sensing microphone: Microphone that measures the ambient sound level in dB and automatically adjusts the APS speaker's volume.

APS assembly: Assembly that includes a pushbutton to actuate the APS components.

audible speech walk message: Audible prerecorded message that communicates to pedestrians which street has the walk interval.

programming mechanism: Device to program the APS' operation.

pushbutton information message: Pushbutton information message as defined in the *California MUTCD*.

pushbutton locator tone: Pushbutton locator tone as defined in the *California MUTCD*.

vibrotactile pedestrian device: Vibrotactile pedestrian device as defined in the *California MUTCD*.

86-5.03A(3) Submittals

Before shipping the APS units to the job site, submit the units with the following to METS:

1. Delivery form including Contract number and your contact information
2. Manufacturer's name
3. Model, lot, and serial numbers
4. Month and year of manufacture
5. Wiring diagram
6. Product data
7. Programming mechanism if not integral to the APS

Submit 5 APS user and operator manuals for each signalized location as informational submittals. Each manual must have a master item index that includes:

1. Descriptions of the APS and its associated equipment and cables
2. Illustrative block diagrams
3. Manufacturer's contact information
4. Technical data specifications
5. Parts list, descriptions, and settings
6. Fault diagnostic and repair procedures
7. Preventative maintenance procedures for maintaining APS performance parameters

Submit the manufacturer's warranty documentation as an informational submittal before installing the APS.

Submit a record of completed field tests, the APS' final configuration, audible sound level and threshold, and a list of all parameter settings.

86-5.03A(4) Quality Control and Assurance

86-5.03A(4)(a) General

The APS must be compatible with the Department-furnished Model 170E/2070L controller assembly.

The power to the APS must be connected to the pedestrian signal's terminal blocks.

86-5.03A(4)(b) Functional Testing

Perform 2 field tests on the APS: (1) when traffic is noisy during peak traffic hours and (2) when traffic is quiet during off-peak hours. Notify the Engineer 15 days before testing the APS.

86-5.03A(4)(c) Warranty

The APS must have a 2-year manufacturer's warranty against any defects or failures. The 2-year warranty period starts at Contract acceptance. Deliver a replacement within 10 days after you receive notification of a failed APS. The Department does not pay for the replacement. Deliver the replacement to the Department's Maintenance Electrical Shop at:

District 8 - Caltrans Electrical Maintenance Yard
175 West Cluster Street
San Bernardino, CA 92408

86-5.03A(4)(d) Training

Provide a minimum of 8 hours of training by a certified manufacturer's representative for up to 8 Department employees selected by the Engineer. The training must include instruction in installing, programming, adjusting, calibrating, and maintaining the APS.

Furnish materials and equipment for the training.

86-5.03B Materials

The housing for the APS assembly must be made of corrosion-resistant material. Theftproof bolts used for mounting the APS housing to the standard must be stainless steel with a chromium content of 17 percent and a nickel content of 8 percent.

The color of metallic housing must match color no. 33538 of FED-STD-595.

The color of plastic housing must match color no. 17038, 27038, or 37038 of FED-STD-595.

The APS assembly must be rainproof and shockproof in any weather condition.

The APS assembly must include:

1. Pushbutton actuator with a minimum diameter of 2 inches. If a mechanical switch is used, it must have:
 - 1.1. Operating force of 3.5 lb
 - 1.2. Maximum pretravel of 5/64 inch
 - 1.3. Minimum overtravel of 1/32 inch
 - 1.4. Differential travel from 0.002 to 0.04 inch
2. Vibrotactile device on the pushbutton or on the arrow.
3. Enclosure with an ambient-sound-level-sensing microphone and weatherproof speaker. The enclosure must:
 - 3.1 Weigh less than 7 lb.
 - 3.2 Measure less than 16 by 6 by 5 inches.
 - 3.3 Fit the all signal pole and lighting standards identified on the plans.
 - 3.4 Have a wiring hole with a diameter not exceeding 1-1/8 inches.
 - 3.5 Be attached to the pole with 2 screws with a diameter from 1/4 to 3/8 inch suitable for use in tapped holes. The clear space between any 2 holes in the post must be at least twice the diameter of the larger hole.
4. Pushbutton sign.

The APS speakers and electronic equipment must be installed inside the APS assembly's enclosure. The speaker grills must be located on the surface of the enclosure.

Speakers must not interfere with the housing or its mounting hardware.

The conductor cable between the APS assembly and the pedestrian signal head must be a no. 9. 20-conductor cable complying with MIL-W-16878D. The wiring must comply with section 13.02 of ITE publication *Equipment and Material Standards* chapter 2, "Vehicle Traffic Control Signal Heads," and be NEC rated for service at +105 degrees C.

The APS must:

1. Include a mechanism for enabling and disabling its operation.
2. Have electronic switches, a potentiometer, or a handheld device for controlling and programming the volume level and messaging. Deliver any handheld programming device to the Engineer.
- 2 Provide information using:
 - 2.1 Audible speech message that plays when the pushbutton is actuated. The message must include the name of the street to be crossed. The APS must have at least 5 audible message options. The Engineer selects the message. The message must have a percussive tone consisting of multiple frequencies with a dominant component of 880 Hz. If the tone is selected as the message, it must repeat 8 to 10 ticks per second.
 - 2.2. Pushbutton locator tone that clicks or beeps. The pushbutton must produce the locator tone at an interval of 1 tone per second. Each tone must have a maximum duration of 0.15 second. The tone volume must adjust in response to the ambient sound level and be audible up to 12 feet from the pushbutton or to the building line, whichever is less.
3. Have a pushbutton that remains functional during an APS failure.

For signalized intersections, the APS must:

1. Have a pushbutton that when actuated activates the pedestrian walk signal's timing during an APS failure.
- 2 Provide information using:
 - 2.1. Audible speech walk message. The message must be activated from the beginning of the walk interval and repeated for its duration. An example of the message is "Peachtree. Walk sign is on to cross Peachtree."

- 2.2. Pushbutton information message that provides the name of the street to be crossed. The message must play when the pushbutton is actuated. An example of the message is "Wait to cross Howard at Grand. Wait."
3. Have a functional pushbutton that activates the pedestrian walk signal whenever actuated, even if the audible speech walk message, the pushbutton information message, the pushbutton locator tone, and the vibrating surface features are disabled.

For unsignalized pedestrian crossings, the APS must have an audible speech message such as "Peachtree. Cross with caution."

86-5.03C Construction

Arrange to have a manufacturer's representative at the job site when the APS is installed. The APS must not interfere with the Department-furnished controller assembly, the signal installation on signal standards, the pedestrian signal heads, or the terminal compartment blocks. The APS electronic control equipment must reside inside the APS assembly and the standard pedestrian signal head.

You are responsible for the compatibility of the components and for making the necessary calibration adjustments to deliver the performance specified. Furnish the equipment and hardware, and then set up, calibrate, and verify the performance of the APS.

Point arrows on the pushbutton signs in the same direction as the corresponding crosswalk. Attach the sign to the APS assembly.

Upon successful installation of the APS, disable the APS function if it is not required immediately.

Do not install an APS on a standard smaller than Type 1.

86-5.03D Payment

Not Used

Replace section 86-6.02 with:

86-6.02 LED LUMINAIRES

86-6.02A General

86-6.02A(1) Summary

Section 86-6.02 includes specifications for installing LED luminaires.

86-6.02A(2) Definitions

CALiPER: Commercially Available LED Product Evaluation and Reporting. A U.S. DOE program that individually tests and provides unbiased information on the performance of commercially-available LED luminaires and lights.

correlated color temperature: Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.

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.

International Electrotechnical Commission (IEC): Organization that prepares and publishes international standards for all electrical, electronic, and related technologies.

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 initial values.

LM-79: Test method from the Illumination Engineering Society of North America specifying 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 test conditions, measurements, and report format for testing and estimating the long-term performance of LEDs for general lighting purposes.

National Voluntary Laboratory Accreditation Program (NVLAP): U.S. DOE program that accredits independent testing laboratories.

power factor: Ratio of the real power component to the complex power component.

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 (SPD): Subsystem or component that protects the unit against short-duration voltage and current surges.

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.

86-6.02A(3) Submittals

Submit a sample luminaire to METS for testing after the manufacturer's testing is completed. Include the manufacturer's test data.

Product submittals must include:

1. LED luminaire checklist.
2. Product specification sheets, including:
 - 2.1. Maximum power in watts.
 - 2.2. Maximum designed junction temperature.
 - 2.3. Heat sink area in square inches.

- 2.4. Designed junction to ambient thermal resistance calculation with thermal resistance components clearly defined.
- 2.5. L70 in hours when extrapolated for the average nighttime operating temperature.
3. LM-79 and LM-80 compliant test reports from a CALIPER-qualified or NVLAP-approved testing laboratory for the specific model submitted.
4. Photometric file based on LM-79 test report.
5. Initial and depreciated isofootcandle diagrams showing the specified minimum illuminance for the particular application. The diagrams must be calibrated to feet and show a 40 by 40 foot grid. The diagrams must be calibrated to the mounting height specified for that particular application. The depreciated isofootcandle diagrams must be calculated at the minimum operational life.
6. Test report showing SPD performance as tested under ANSI/IEEE C62.41.2 and ANSI/IEEE C62.45.
7. Test report showing mechanical vibration test results as tested under California Test 611 or equal.
8. Data sheets from the LED manufacturer that include information on life expectancy based on junction temperature.
9. Data sheets from the power supply manufacturer that include life expectancy information.

Submit documentation of a production QA performed by the luminaire manufacturer that:

1. Ensures the minimum specified performance level
2. Includes a documented process for resolving problems

Submit the QA documentation as an informational submittal.

Submit the manufacturer's warranty documentation as an informational submittal before installing LED luminaires.

86-6.02A(4) Quality Control and Assurance

86-6.02A(4)(a) General

The Department may test random samples of the luminaires under section 86-2.14A. The Department tests luminaires under California Test 678 and may test any parameters specified in section 86-6.01.

Fit 1 sample luminaire with a thermistor or thermocouple temperature sensor. A temperature sensor must be mounted on the:

1. LED solder pad as close to the LED as possible
2. Power supply case
3. Light bar or modular system as close to the center of the module as possible

Other configurations must have at least 5 sensors per luminaire. The Engineer provides advice on sensor location. Thermocouples must be either Type K or C. Thermistors must be a negative-temperature-coefficient type with a nominal resistance of 20 k Ω . Use the appropriate thermocouple wire. The leads must be a minimum of 6 feet. Submit documentation with the test unit describing the type of sensor used.

Before performing any testing, energize the sample luminaires for a minimum of 24 hours at 100 percent on-time duty cycle and a temperature of +70 degrees F.

Depreciate the luminaire lighting's performance for the minimum operating life by using the LED manufacturer's data or the data from the LM-80 test report, whichever results in a higher lumen depreciation.

Failure of the luminaire that renders the unit noncompliant with section 86-6.02 specifications is cause for rejection.

86-6.02A(4)(b) Warranty

Provide a 7-year manufacturer's warranty against any defects or failures. The warranty period begins on the date of Contract acceptance. Furnish a replacement luminaire within 10 days after receipt of the failed luminaire. The Department does not pay for the replacement. Deliver replacement luminaires to the Department's Maintenance Electrical Shop at:

San Bernardino Maintenance Electrical Shop
 175 West Cluster Street
 San Bernardino, CA 92408

86-6.02B Materials

86-6.02B(1) General

The luminaire must include an assembly that uses LEDs as the light source. The assembly must include a housing, an LED array, and an electronic driver. The luminaire must:

1. Be UL listed under UL 1598 for luminaires in wet locations or an equivalent standard from a recognized testing laboratory
2. Have a minimum operational life of 63,000 hours
3. Operate at an average operating time of 11.5 hours per night
4. Be designed to operate at an average nighttime operating temperature of 70 degrees F
5. Have an operating temperature range from -40 to +130 degrees F
6. Be defined by the following applications:

Application	Replaces
Roadway 1	200 W high-pressure sodium luminaire mounted at 34 ft
Roadway 2	310 W high-pressure sodium luminaire mounted at 40 ft
Roadway 3	310 W high-pressure sodium luminaire mounted at 40 ft with back side control
Roadway 4	400 W high-pressure sodium luminaire mounted at 40 ft

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.

86-6.02B(2) Luminaire Identification

Each luminaire must have the following identification permanently marked inside the unit and outside of its packaging box:

1. Manufacturer's name
2. Trademark
3. Model number
4. Serial number
5. Month and year of manufacture
6. Lot number
7. Contract number
8. Rated voltage
9. Rated wattage
10. Rated power in VA

86-6.02B(3) Electrical Requirements

The luminaire must operate from a 60 ± 3 Hz AC power source. 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). The luminaire must operate over the entire voltage range or the voltage range must be selected from either of the following options:

1. Luminaire must operate over a voltage range of 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 of 347 to 480 V(ac). The operating voltage for this option is 480 V(ac).

The power factor of the luminaire must be 0.90 or greater. The total harmonic distortion, current, and voltage induced into an AC power line by a luminaire must not exceed 20 percent. The maximum power consumption allowed for the luminaire must be as shown in the following table:

Application	Maximum consumption (watts)
Roadway 1	165
Roadway 2	235
Roadway 3	235
Roadway 4	300

86-6.02B(4) Surge Suppression and Electromagnetic Interference

The luminaire's on-board circuitry must include an SPD to withstand high repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The SPD 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 SPD must comply with UL 1449. The SPD must be tested under ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

The luminaires and associated on-board circuitry must comply with the Class A emission limits under 47 CFR 15, subpart B, for the emission of electronic noise.

86-6.02B(5) Compatibility

The luminaire must be operationally compatible with currently-used lighting control systems and photoelectric controls.

86-6.02B(6) Photometric Requirements

The luminaire must maintain a minimum illuminance level throughout the minimum operating life. The L70 of the luminaire must be the minimum operating life or greater. The measurements must be calibrated to standard photopic calibrations. The minimum maintained illuminance values measured at a point must be as shown in the following table:

Application	Mounting height (ft)	Minimum maintained illuminance (fc)	Light pattern figure (isofootcandle curve)
Roadway 1	34	0.15	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 2	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 3	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>for $y \geq 0$ (street side)</p> <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>

Roadway 4	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>where: x = direction longitudinal to the roadway y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>
-----------	----	-----	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The luminaire must have a correlated color temperature range from 3,500 to 6,500 K. The color rendering index must be 65 or greater.

The luminaire must not allow more than:

1. 10 percent of the rated lumens to project above 80 degrees from vertical
2. 2.5 percent of the rated lumens to project above 90 degrees from vertical

86-6.02B(7) Thermal Management

The passive thermal management of the heat generated by the LEDs must have enough capacity to ensure proper operation of the luminaire over the minimum operation life. The LED maximum junction temperature for the minimum operation 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. The heat sink material must be 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 outside temperature is 100 degrees F or greater.

86-6.02B(8) Physical and Mechanical Requirements

The luminaire must:

1. Be a single, self-contained device not requiring job-site assembly for installation
2. Have an integral power supply
3. Weigh no more than 35 lb
4. Have a maximum-effective projected area of 1.4 sq ft when viewed from either side or end
5. Have a housing color that matches color number 26152 of FED-STD-595.

The housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B 117. 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.

Each refractor or lens must be made from UV-inhibited high-impact plastic such as acrylic or polycarbonate or heat- and impact-resistant glass and be resistant to scratching. Polymeric materials except lenses of enclosures containing either the power supply or electronic components of the luminaire must be made of UL94VO flame retardant materials. The housing's paint must comply with section 86-2.16. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

Provide each housing with a slip fitter capable of mounting on a 2-inch pipe tenon. This slip fitter must fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches. The slip fitter must be capable of being adjusted a minimum of ±5 degrees from the axis of the tenon in a minimum of 5 steps: +5, +2.5, 0, -2.5, -5. The clamping brackets of the slip fitter must not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip fitter's mounting brackets must develop a permanent set in excess of 1/32 inch when the bracket's two or four 3/8-inch-diameter cap screws are tightened to 10 ft-lb. Two sets of cap screws may be furnished to allow the slip fitter to be mounted on the pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap

screws and the clamping brackets must be made of corrosion-resistant materials or treated to prevent galvanic reactions and be compatible with the luminaire housing and the mast arm.

The LED luminaire must be assembled and manufactured such that its internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. When tested under California Test 611, the luminaire to be mounted horizontally on the mast arm must be capable of withstanding the following cyclic loading for a minimum of 2 million cycles without failure of any luminaire part:

Cyclic Loading

Plane	Power supply	Minimum peak acceleration level
Vertical	Installed	3.0 g peak-to-peak sinusoidal loading (same as 1.5 g peak)
Horizontal ^a	Installed	1.5 g peak-to-peak sinusoidal loading (same as 0.75 g peak)

^aPerpendicular to the direction of the mast arm

The housing must be designed to prevent the buildup of water on top of the housing. Exposed heat sink fins must be oriented to allow water to freely run off of 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 ANSI/IEC rating of IP66. The power supply enclosure must be protected to at least an ANSI/IEC rating of IP43.

Furnish each mounted luminaire with an ANSI C136.10-compliant, locking-type photocontrol receptacle and a raintight shorting cap. The receptacle must comply with section 86-6.11A.

Furnish each mounted luminaire with an ANSI C136.41-compliant, locking-type photocontrol receptacle with dimming connections and a raintight shorting cap. The receptacle must comply with section 86-6.11A.

When the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door must be secured to the housing such that accidental opening is prevented. A safety cable must mechanically connect the door to the housing.

Field wires connected to the luminaire must terminate on a barrier-type terminal block secured to the housing. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6. Each terminal position must be clearly identified.

The power supply must be rated for outdoor operation and have at least an ANSI/IEC rating of IP65.

The power supply must be rated for a minimum operational life equal to the minimum operational life of the luminaire or greater.

The power supply case temperature must have a self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.

The power supply must have 2 leads to accept standard 0-10 V(dc). The dimming control must be compatible with IEC 60929. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.

Conductors and terminals must be identified.

86-6.02C Construction

Not Used

86-6.02D Payment

Not Used

Add to section 86-6.11B(1):

Photoelectric units for illuminated signs must have a "turn-on" level between 20 and 30 foot-candles, corresponding to a switching level of approximately 40 to 60 foot-candles measured in the horizontal plane. "Turn-off" level must not exceed 3 times the "turn-on" level.

86-6.14 Communication System

86-6.14A(1) Summary

Section 86-6.14 contains requirements for installing the Communication System.

DESCRIPTION
Model 170 Ethernet Card
Cat 5E Cable
Ethernet Extender
Ethernet Switch
CCTV
LTE Modem
System Testing and Documentation

ETHERNET EXTENDER

Add to section 86-XXXX

86-XXXXX ETHERNET EXTENDER

86-XXXXX General

86-XXXXX Summary

The Ethernet extender (EE) must provide a secure Mbps point to point Ethernet connection.

Ethernet Extender must meet the following:

1. Standards
 - 1.1. 802.3 (10Base-T).
 - 1.2. 802.3u (100Base-TX).
 - 1.3. 802.3x Flow Control.
 - 1.4. Ethernet over VDSL.
2. Ethernet Port Features
 - 2.1. 2.X 10/100 Mbps auto sensing full/half-duplex RJ45 Ethernet uplink port.
 - 2.2. Supports Auto MDIX.
 - 2.3. Supports flow control for full duplex operation.
 - 2.4. Supports back pressure for half-duplex operation.
 - 2.5. VDSL. Telephone line 24 AWG (1 pair wire) or larger.
3. LED Indicators
 - 3.1. Per input: Power Status LED.
 - 3.2. Per Port: 10/100TX
 - 3.3. VDSL Error, Link, Loc, Remote.
4. Switching Features
 - 4.1. Dual auto-Sensing 10/100 Mbps Ethernet ports with Auto MDIX.
5. Power
 - 5.1. External Switching Power Adapter.
 - 5.2. Input Voltage 12 to 30 VDC.
6. Environment Operating
 - 6.1. -40 F to 167 F.
 - 6.2. Humidity 5 percent to 95 percent (non condensing).
7. Regulatory Approvals:
 - 7.1. EMI:
 - 7.1.1 FCC Part 15 Class A.
 - 7.1.2 EN61000-3-2.
 - 7.1.3 EN61000-3-3.
 - 7.2. EMS:
 - 7.2.1 EN61000-6-2.
 - 7.2.2 EN61000-4-3.
 - 7.2.3 EN61000-4-4.
 - 7.2.4 EN61000-4-5.
 - 7.2.5 EN61000-4-6.
 - 7.2.6 EN61000-4-8.
8. Mechanical
 - 8.1. Aluminum case

8.2 IP30.

9. NEMA TS1 and TS2 Environmental requirements for Traffic Control equipment.

86-2.21A(2)(a) Warranty

Provide a written warranty against defects in materials and workmanship for a minimum period of 3 years. The effective date of the warranty is the date of successful completion of acceptance testing.

86-3.06C Construction

Install the EE as per the manufacturer's instructions and the plans.

86-3.06D Payment

Not used.

Add to Section 86-2.14:

86-2.14D System Testing and Documentation

86-2.14D(1) General

System testing and documentation covers the integration testing which is required to validate the operational performance of the communication system.

86-2.14D(1)(a) Submittals

System Documentation

Submit a draft copy of all documentation for review and approval before production of documentation. The Engineer will review and approve or reject the draft documentation within 2 weeks of receipt.

Deliver two copies of all final documents. The copies must be 8 1/2" x 11" and bound in three-ring, hard-covered binders, complete with dividers.

Documentation must consist of the following types of manuals and drawings and must include the information described.

1. Configuration of Hardware and Software Documentation
 - 1.1. Provide proper documentation for all configurations of hardware and software.
2. Test Results
 - 2.1. The test result section of the operations and maintenance must include a copy of the results for all the tests that you have conducted.

86-2.14D(1)(b) Quality Control and Assurance

86-2.14D(1)(b)(i) Subsystem Testing You must test all material, equipment and cable after installation. These tests must comply with the "Performance Testing" sub-sections for each individual item where applicable.

You must supply all test equipment required.

The following network information will be supplied. You must program the equipment prior to all tests:

1. IP addresses
2. Mask
3. Gateway

You must submit an installation and test plan which details the method of installation and site testing for all material, equipment, and cable and the associated schedule of activities. Two copies of the installation and test plan must be submitted for approval, at least 2 weeks before proposed testing dates.

The equipment and hardware must be installed as shown and described. Tests and inspections must include:

1. Visual inspection for damaged or incorrect installation.
2. Measurement of parameters and operating conditions.

These tests must be performed in accordance with the approved installation and test plan.

You must notify the Engineer of your intent to proceed with installation and testing 48 hours before commencement of each test.

86-2.14D(1)(b)(ii) Physical Inspection

You must provide documentation to prove delivery of all material, equipment, cable and documentation. If any material or documentation is outstanding or have been replaced under pre-acceptance warranty a physical inspection and documentation must be provided for this material. The physical inspection must consist of inspecting all installed material to ensure that workmanship satisfies the specified requirements.

86-2.14D(1)(b)(iii) Data Link Testing

From the District's Transportation Management Center (TMC), an Internet Control Message Protocol (ICMP) echo request must be sent each element (CCTV, , RMS, , ICC) using a test computer to verify all of the hardware is properly connected and responding to the assigned IP address. Each element must have a unique IP address and a valid response to the ICMP echo request to verify the reliability of the IP address for each element.

To verify all of the communication equipment is properly connected and responding to the assigned IP addresses, the acceptance testing for each element consists of the following steps:

2. From the TMC, with the communication system functioning under normal conditions, each element must respond as follows:
 - D. The element must respond correctly to an ICMP echo requests from the District TMC.
 - E. The element must be turned OFF. An ICMP echo request from the District TMC must then be sent and the element must not be responsive.
 - F. The element must then be turned ON. An ICMP echo request from the District TMC must then be sent and the element must be responsive.

Verify that each element responds and record the response time for each ICMP echo request.

86-2.14D(1)(b)(v) Acceptance Testing

Acceptance testing includes the preparation of an acceptance test plan, conducting acceptance tests and subsequent retests, and documentation of the results.

Final acceptance tests must be conducted after the site test results have been reviewed and accepted. These tests include the complete system in normal operations.

The acceptance test plan must detail all tests to be performed, the test results which are expected and the test schedule. The acceptance test plan will include the following major tests and acceptance categories:

1. Successful acceptance of Subsystem testing
2. Performance tests after connecting the system.
3. Functional tests after connecting the system.

All acceptance test results must be fully documented and such documentation provided as a condition of acceptance.

86-2.14D(1)(b)(vi) Performance Tests

You must conduct operational performance tests on the following:

1. All data circuits operational from TMC to the IC field equipment.

Steel slag used to produce aggregate for AS and Class 2 AB must be crushed such that 100 percent of the material will pass a 3/4-inch sieve and then control aged for at least 3 months under conditions that will maintain all portions of the stockpiled material at a moisture content in excess of 6 percent of the dry weight of the aggregate.

For steel slag aggregate, provide separate stockpiles for controlled aging of the slag. An individual stockpile must not contain less than 10,000 tons or more than 50,000 tons of slag. The material in each individual stockpile must be assigned a unique lot number, and each stockpile must be identified with a permanent system of signs. Maintain a permanent record of:

1. Dates for:
 - 1.1. Completion of stockpile
 - 1.2. Start of controlled aging
 - 1.3. Completion of controlled aging
 - 1.4. Making of tests
2. Test results

For each stockpile of steel slag aggregate, moisture tests must be made at least once each week. The time covered by tests that show a moisture content of 6 percent or less is not included in the aging time.

Notify METS and the Engineer upon completion of each stockpile and the start of controlled aging and upon completion of controlled aging. Do not add aggregate to a stockpile unless a new aging period is started.

Steel slag used for imported borrow must be weathered for at least 3 months.

Each delivery of aggregate containing steel slag for AS or Class 2 AB must include a delivery tag for each load. The tag must identify the lot by the stockpile number, slag aging location, and stockpile completion and controlled aging start date.

You may blend air-cooled iron blast furnace slag or natural aggregate in proper combinations with steel slag aggregate to produce the specified gradings.

California Test 202 is modified by California Test 105 whenever the difference in sp gr between the coarse and fine portions of the aggregate or between the blends of different aggregates is 0.2 or more.

For slag used as aggregate in HMA, the Kc factor requirements in California Test 303 do not apply.

If steel slag aggregates are used to produce HMA, no other aggregates may be used in the mixture except that up to 50 percent of the material passing the no. 4 sieve may consist of iron blast furnace slag aggregates, natural aggregates, or a combination of these. If iron blast furnace aggregates, natural aggregates, or a combination of these are used in the mixture, each aggregate type must be fed to the drier at a uniform rate. Maintain the feed rate of each aggregate type within 10 percent of the amount set. Provide adequate means for controlling and checking the feeder accuracy.

Store steel slag aggregate separately from iron blast furnace slag aggregate. Store each slag aggregate type separately from natural aggregate.

For HMA produced from steel slag aggregates, iron blast furnace slag aggregates, natural aggregates, or any combination of these, the same aggregate must be used throughout any one layer. Once an aggregate type is selected, do not change it without authorization.

Aggregate containing slag must comply with the applicable quality requirements for the bid items in which the aggregate is used.

87-2.03 CONSTRUCTION

Do not place aggregate produced from slag within 1 foot of a non-cathodically protected pipe or structure unless the aggregate is incorporated in concrete pavement, in HMA, or in treated base.

Do not place slag aggregate used for embankments within 18 inches of finished slope lines measured normal to the plane of the slope.

87-2.04 PAYMENT

The Department reduces the payment quantity of HMA if:

1. Steel slag aggregates are used to produce HMA
2. The sp gr of a compacted stabilometer test specimen is in excess of 2.40

The Department prepares the stabilometer test specimen under California Test 304 and determines the sp gr of the specimen under Method C of California Test 308.

The Department determines the HMA payment quantity by multiplying the quantity of HMA placed in the work by 2.40 and dividing the result by the sp gr of the compacted stabilometer test specimen. The Department applies this quantity reduction as often as necessary to ensure accurate results.

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90 CONCRETE

Add to section 90-1.021(2)(a):

For concrete at the Newport RD OC (Widen) and Salt Creek Bridge (Widen), the mortar strength of the fine aggregate relative to the mortar strength of Ottawa sand must be a minimum of 100 percent under California Test 515.

Add to section 90-2.02B:

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

Chemical property	Requirement (percent)
Silicon dioxide (SiO ₂) ^a	90 min
Loss on ignition	5.0 max
Total alkalis as Na ₂ O equivalent	3.0 max

Physical property	Requirement
Particle size distribution	
Less than 45 microns	95 percent
Less than 10 microns	50 percent
Strength activity index with portland cement ^b	
7 days	95 percent (min percent of control)
28 days	110 percent (min percent of control)
Expansion at 16 days when testing project materials under ASTM C 1567 ^c	0.10 percent max
Surface area when testing by nitrogen adsorption under ASTM D 5604	40.0 m ² /g min

^aSiO₂ in crystalline form must not exceed 1.0 percent.

^bWhen tested under AASHTO M 307 for strength activity testing of silica fume.

^cIn the test mix, Type II or V portland cement must be replaced with at least 12 percent rice hull ash by weight.

Appendix
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* Note: See the first page of this document description for a detailed Table of Contents.

Appendix A
AQMD Recommendations

Dust Abatement Attachments

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AQMD SIGNAGE RECOMMENDATIONS**November, 2001**

Plan holder shall post signage at specified locations on the subject property in accordance with the standards specified below. The exception to the standards is that all letters shall be 4 inches high, with the names and telephone numbers of appropriate contacts and services in bold print, as indicated in the standards. These signs shall also include the SCAQMD toll free complaint line 1-800-CUT-SMOG (1-800-288-7664) and the telephone number for the Environmental Observer. These signs shall be posted within 50 feet of the curb on all four (4) corners of the subject property.

For each Dust Control Plan aggregating less than, or equal to, ten (10) acres:

1. The applicant shall install a sign on such property which is visible to the public that meets the following requirements:
 - (a) Such sign shall measure at least four (4) feet wide by four (4) feet high and conform to the specifications in 1 (a) below.

For each Dust Control Plan aggregating over ten (10) acres:

2. The applicant shall install a sign on such property which is visible to the public that meets the following requirements:
 - (a) Such sign shall measure at least eight (8) feet wide by four (4) feet high and conform to the specifications in 1 (b) below.

THE SIGN SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

1. **The sign boards shall be constructed with materials capable of withstanding the environment in which they are placed.**

(a) For 4' x 4' signs, the District recommends the following:

- I. ¾" A/C laminated plywood board
- II. Two 4" x 4" posts
- III. The posts should be attached to the edges of the plywood board with at least 2 carriage bolts on each post.
- IV. The front surface of the sign board should be painted in the contrasting color of a white background with black lettering.

(b) For 4' x 8' signs, the District recommends the following:

- I. 1" A/C laminated plywood board
- II. Two 5" x 6" posts
- III. The posts should be attached to the 4' edges of the plywood board with at least 2 carriage bolts on each post.
- IV. The front surface of the sign board should be painted in the contrasting color of a white background with black lettering.

2. The sign board shall be installed and maintained in a condition such that members of the public can easily view, access, and read the sign at all times until the expiration date of the Dust Control plan.

(a) For 4' x 4' signs, the District recommends the following:

- I. The lower edge of the sign board should be mounted at least 2' above the existing ground surface to facilitate ease of viewing.
- II. The posts should be set in a hole at least 3' deep with concrete footings to preclude downing by high winds.
- III. On the construction site, the sign should be positioned such that nothing obstructs the public's view from the primary street access point.
- IV. For construction projects that are developed in phases, the sign should be moved to the area that is under active construction.
- V. In situations where all phases of the construction project are completed on a property prior to expiration of the Dust Control Plan, a written request for cancellation of the Dust Control Plan must be submitted to the Engineer.

(b) For 4' x 8' signs, the District recommends the following:

- I. The lower edge of the sign board should be mounted at least 2' above the existing ground surface to facilitate ease of viewing.
- II. The posts should be set in a hole at least 4' deep with concrete footings to preclude downing by high winds.
- III. On the construction site, the sign should be positioned such that nothing obstructs the public's view from the primary street access point.
- IV. For construction projects that are developed in phases, the sign should be moved to the area that is under active construction.
- V. In situations where all phases of the construction project are completed on a property prior to expiration of the Dust Control Plan, a written request for cancellation of the Dust Control Plan must be submitted to the Engineer.

3. The sign board shall contain the following information:

- (a) Project Name
- (b) Name of Prime Contractor
- (c) Phone Number of Contractor's Employee Responsible for Dust Control Matters
- (d) County designated phone number (to be provided by the Engineer)
- (e) South Coast Air Quality Management District Phone Number

4. The sign board shall be designed to the following alpha and numeric text dimensions (sign boards written in longhand are unacceptable).

(a) For a permittee subject to the 4' x 4' sign requirement, the District provides the following example: (as modified by the County of Riverside for use on County Public Works projects)

1" UPPERCASE Letters →	PROJECT NAME:		3 ½" Title Case Bold Letters ←
1" UPPERCASE Letters →	CONTRACTOR		3 ½" Title Case Bold Letters ←
1" Title Case Letters →	Contractor's Dust Control Phone #		3" Bold Numbers ←
1" Title Case Letters →	County of Riverside Phone #		3" Bold Numbers ←
1" Title Case Letters →	Phone Number:	SCAQMD 1-800-CUT-SMOG	3 ½" Bold Numbers ←

"Title Case" means the first letter of a word is capitalized and subsequent letters are lower case.

AQMD Recommendations

(b) For a permittee subject to the 4' x 8' sign requirement, the District provides the following example: (as modified by the County of Riverside)

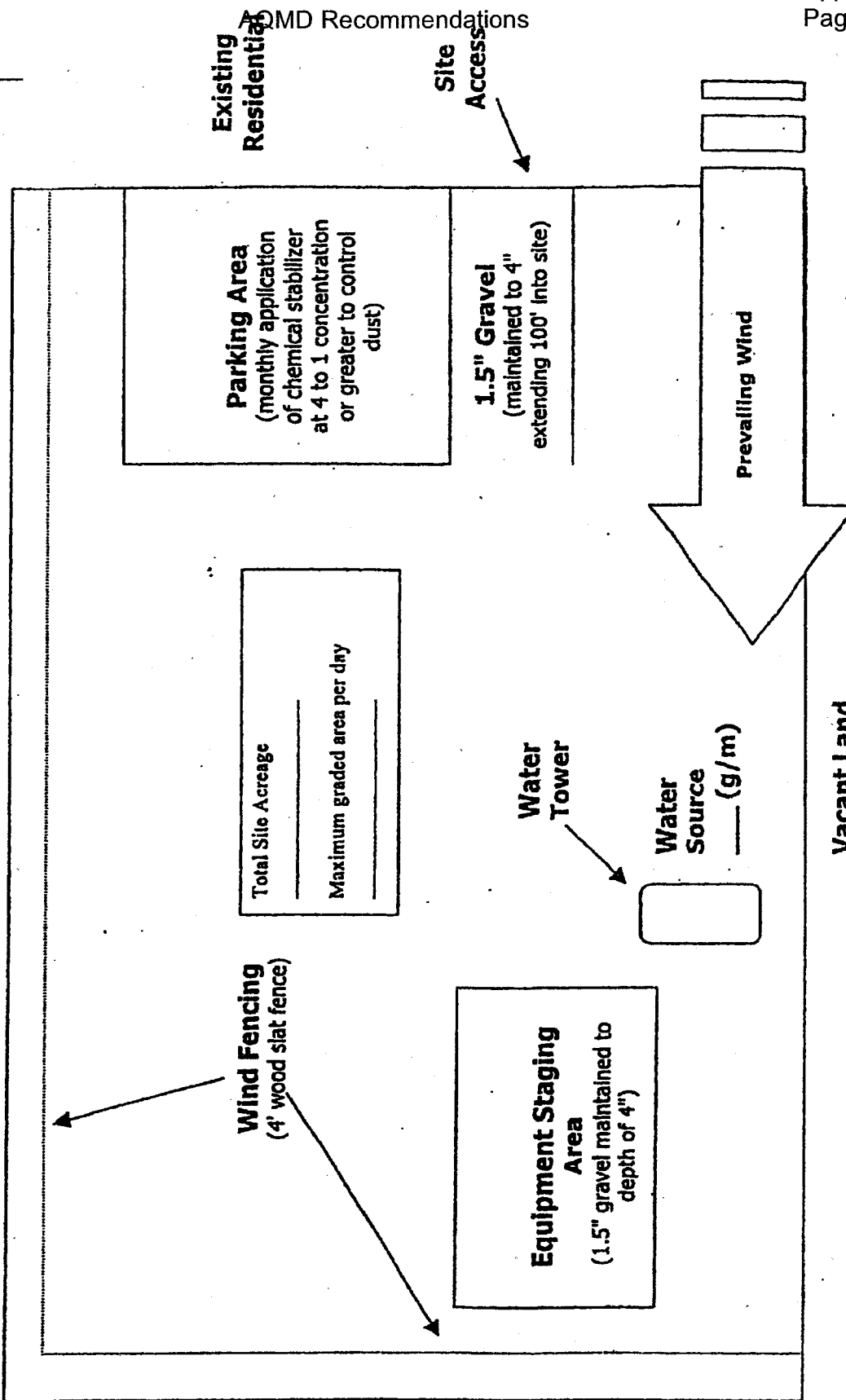
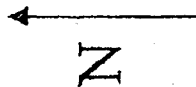
2" UPPERCASE Letters	PROJECT NAME:		4" Title Case Bold Letters
2" UPPERCASE Letters	CONTRACTOR		4" Title Case Bold Letters
2" Title Case Letters	Contractor's Dust Control Phone #		4" Bold Numbers
2" Title Case Letters	County of Riverside Phone #	909-	4" Bold Numbers
2" Title Case Letters	Phone Number:	SCAQMD 1-800-CUT-SMOG	4 1/2" Bold Numbers
2" Title Case Letters	COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT		

Section 1

Simplified Sample Site Plan

Existing Residential

Distance and location of nearest:
 Residence _____
 Business _____



Existing Residential
 Site Access
 MD Recommendations

Remember...
**DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,
 REGARDLESS OF CONSTRUCTION STATUS**

Plan Review Checklist Clearing/Grubbing/Mass Grading Phase

If feasible, use grading permit conditions to break the project into phases so that only a portion of the site is disturbed at any given time to ensure control of fugitive dust. This technique is critical for project sites with greater than 100 acres.

Prior to initiating activity, pre-water site through use of portable irrigation lines. At least 72 hours of pre-watering is recommended for each area prior to initiating earth-movement. Require the Applicant to specify water source and available flow rate (g/m).

Water applied continuously to all disturbed portions of the site by means of water truck/water pull as necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Also, for cut and fill activities, one 10,000 gallon water pull is estimated to be necessary for each 7,000 cubic yards of daily earth-movement. Multiple 4,000-gallon water trucks may be used in place of one 10,000-gallon water pull. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during mass grading and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.

Water towers are necessary for projects with more than 10 acres of active construction. Without a water tower, it can take up to 30 minutes to fill a 2,000 gallon water truck. Also, multiple water towers are necessary for projects that use water pulls as filling one 10,000 gallon water pull can drain a water tower which takes up to 40 minutes to refill.

Wind fencing is necessary between the site and nearby residences or businesses. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blowsand from being deposited onto the site or traveling through the site.

A perimeter watering system consisting of portable irrigation equipment may be an effective mitigation system to protect surrounding residences and businesses. The portable watering system may be used in place of or in conjunction with watering trucks. The local jurisdiction may also be provided access to this equipment.

Remember...

**DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,
REGARDLESS OF CONSTRUCTION STATUS**

- Construction site accesses are to be improved with 1.5" gravel maintained to a depth of 4" , at least 20' wide, and extending 100 feet into the site. If the project site is not balanced, a wheel washing system and/or ribbed steel plates should be placed in the roadway before the vehicle enters the graveled area to clean the tires and prevent trackout.
- Equipment staging areas are to be treated with 1.5" gravel maintained to a depth of 4".
- Employee parking areas are to be covered with 1.5" gravel maintained to a depth of 4" or treated with chemical dust suppressants at a 4 to 1 ratio on at least a monthly basis to prevent fugitive dust.
- Chemical dust suppressants are to be mixed at a ratio of 20 to 1 and applied to all disturbed surfaces that are proposed to remain inactive for a period of at least 10 consecutive days. These products are effective in preventing and controlling dust. Recordkeeping is necessary to demonstrate compliance.
- All project sites greater than 100 acres shall monitor daily wind speeds and AQMD forecasted wind events (call 1.800.CUT.SMOG, press one for air quality information, and then press five for Coachella Valley wind forecasts). Operators shall maintain these records for review by any local code enforcement officer or AQMD inspector.
- An environmental observer whose primary duty is to oversee dust control at the site is to be used for construction projects greater than 100 acres and/or sites with more than 50 acres of active construction. The environmental observer is tasked with monitoring dust abatement measures and authorized to deploy additional water trucks and other dust control actions (i.e., wind fencing, street sweepers, chemical dust suppressants, etc.) as necessary to prevent or control fugitive dust.
- Other (specify): _____

Remember...
DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,
REGARDLESS OF CONSTRUCTION STATUS

Plan Review Checklist Finish Grading Phase

Water applied continuously to all disturbed portions of the site by means of water truck/water pull as necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Also, for cut and fill activities, one 10,000 gallon water pull is estimated to be necessary for each 7,000 cubic yards of daily earth-movement. Multiple 4,000-gallon water trucks may be used in place of a 10,000-gallon water pull. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during finish grading and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.

Water towers are necessary for projects with more than 10 acres of active construction. Without a water tower, it can take up to 30 minutes to fill a 2,000 gallon water truck. Also, multiple water towers are necessary for projects that use water pulls as filling one 10,000 gallon water pull can drain a water tower which takes up to 40 minutes to refill.

Wind fencing is necessary between the site and nearby residences or businesses to reduce fugitive dust. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blow sand from being deposited onto the site or traveling through a site.

Chemical dust suppressants are to be applied at a concentration of at least 10 to 1 to finish graded areas once final elevations have been reached. For areas that will remain inactive for longer periods, vegetation can be a cost-effective alternative to chemical stabilization. Wind fencing or other obstructions can keep the stabilized area free from future disturbances.

Construction site access(es) are to be improved with 1.5" gravel maintained to a depth of at least 4" with a minimum width of at least 20', extending 100 feet into the project site.

Equipment staging areas are to be treated with 1.5" gravel maintained to a depth of 4".

Internal roadway networks are to be treated with chemical dust suppressants at a minimum rate of at least 4 to 1 and retreated on a monthly basis once final roadway elevations have been reached.

Employee parking areas are to be treated with chemical dust suppressants at a mix ratio of at least 4 to 1 and retreated on at least a monthly basis or covered with 1.5" gravel maintained to a depth of 4" to prevent fugitive dust.

Other (specify): _____

**Remember...
DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,
REGARDLESS OF CONSTRUCTION STATUS**

Plan Review Checklist Construction Phase

Water applied continuously to all disturbed portions of the site by means of water truck/water pull is necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during the construction phase and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.

Wind fencing is necessary between the site and nearby residences or businesses. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blowsand from being deposited onto the site or traveling through the site. Block walls, if part of the final project, can replace wind fencing during the construction phase.

Chemical dust suppressants are to be applied at a concentration of at least 20 to 1 to finish graded areas once final elevations have been reached. For areas that will remain inactive for longer periods, vegetation can be a cost-effective alternative to chemical stabilization. Wind fencing or other obstructions can keep the stabilized area free from future disturbances.

Construction site accesses are to be improved with 1.5" gravel, maintained to a depth of 4", with a width of at least 20', extending 100' into the project site. Paving internal roadways can substitute for gravel.

Internal roadway networks are to be paved as early as feasible in the construction phase. Street sweeping of internal and/or external access roads will likely be required to control entrained road dust.

Employee parking areas are to be treated with chemical dust suppressants at a mix ratio of no less than 4 to 1 and retreated on a monthly basis, or more frequently if fugitive dust is observed. If internal roadway is complete, employees are to be instructed to park on paved roads.

Other (specify): _____

Remember...
DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,
REGARDLESS OF CONSTRUCTION STATUS

RULE 403 IMPLEMENTATION HANDBOOK

REASONABLY AVAILABLE CONTROL MEASURES

Paragraph (d)(3) of Rule 403 allows activities outside the South Coast Air Basin (see Figure 2-1) to implement reasonably available control measures in lieu of best available control measures. Additionally, as specified by subparagraph (f)(3)(D) of Rule 403, any person seeking approval of a fugitive dust emissions control plan for projects outside the South Coast Air Basin must demonstrate to the satisfaction of the District that the given activity is employing all reasonably available fugitive dust control measures.

The District has prepared the attached listing of reasonably available fugitive dust control measures for a variety of source categories. This list is based on the U.S. Environmental Protection Agency's reference document entitled, "Control of Open Fugitive Dust Sources," Midwest Research Institute, September 1988.

The District encourages the use of those dust control measures that minimize the use of potable water. When water is needed, reclaimed water should be utilized to the greatest extent feasible.

RULE 403 IMPLEMENTATION HANDBOOK

REASONABLY AVAILABLE CONTROL MEASURES

The left column contains a listing of the sources of fugitive dust which are intended for emission control under District Rule 403 and a listing of control measures and high-wind measures. The right column contains a description of the reasonably available fugitive dust control measures for each of the sources.

Source: (1) Land Clearing/Earth-Moving

CONTROL MEASURES

DESCRIPTION

- | | |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (A) Watering | (1) Application of water by means of trucks, hoses and/or sprinklers prior to conducting any land clearing. This will increase the moisture content of the soils; thereby increasing its stability. |
| | (2) Pre-application of water to depths of proposed cuts. |
| | (3) Once the land clearing/earth moving activities are complete, a second application of water can generate a thin crust that stabilizes the disturbed surface area provided that it is not disturbed. (Security fencing can be used to prevent unwanted future disturbances of sites where a surface crust has been created). |
| (B) Chemical stabilizers | (1) Only effective in areas which are not subject to daily disturbances. |
| | (2) Vendors can supply information on product application and required concentrations to meet the specifications established by the Rule. |
| (C) Wind fencing | (1) Three- to five-foot barriers with 50% or less porosity located adjacent to roadways or urban areas can be effective in reducing the amount of windblown material leaving a site. |
| | (2) Would likely be used in conjunction with other measures (e.g., watering, chemical stabilization, etc.) to ensure that visible emissions do not cross a property line. |
| (D) Cover haul vehicles | (1) Entire surface area of hauled earth should be covered once vehicle is full. |
| (E) Bedliners in haul vehicles | (1) When feasible, use in bottom-dumping haul vehicles. |

HIGH WIND MEASURE

- (a) Cease all active operations; or
(b) Apply water within 15 minutes to any soil surface which is being moved or otherwise disturbed.

Source: (2) Unpaved Roads

CONTROL MEASURES

DESCRIPTION

- | | |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (F) Paving | (1) Requires street sweeping/cleaning if subject to material accumulation. |
| (G) Chemical stabilization | (1) Vendors can supply information as to application methods and concentrations to meet the specifications established by the Rule
(2) Not recommended for high volume or heavy equipment traffic use. |
| (H) Watering | (1) In sufficient quantities to keep surface moist.
(2) Required application frequency will vary according to soil type, weather conditions, and vehicular use. |
| (I) Reduce speed limits | (1) 15 mile per hour maximum. May need to be used in conjunction with watering or chemical stabilization to prevent visible emissions from crossing the property line. |
| (J) Reduce vehicular trips | (1) Access restriction or redirecting traffic to reduce vehicle trips by a minimum of 60 percent. |
| (K) Gravel | (1) Gravel maintained to a depth of four inches can be an effective measure.
(2) Should only be used in areas where paving, chemical stabilization or frequent watering is not feasible. |

HIGH WIND MEASURE

- (c) Apply a chemical stabilizer (to meet the specifications established by the Rule) prior to wind events; or
- (d) Apply water once each hour; or
- (e) Stop all vehicular traffic.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (3) Storage Piles

CONTROL MEASURES

DESCRIPTION

- (L) Wind sheltering
 - (1) Enclose in silos.
 - (2) Install three-sided barriers equal to height of material, with no more than 50 percent porosity.
- (M) Watering
 - (1) Application methods include: spray bars, hoses and water trucks.
 - (2) Frequency of application will vary on site-specific conditions.
- (N) Chemical stabilizers
 - (1) Best for use on storage piles subject to infrequent disturbances.
- (O) Altering load-in/load-out procedures
 - (1) Confine load-in/load-out procedures to leeward (downwind) side of the material.
 - (2) May need to be used in conjunction with wind sheltering to prevent visible emissions from crossing the property line.
- (P) Coverings
 - (1) Tarps, plastic, or other material can be used as a temporary covering.
 - (2) When used, these should be anchored to prevent wind from removing coverings.

HIGH WIND MEASURE

- (f) Apply chemical stabilizers (to meet the specifications established by the Rule) prior to wind events; or
- (g) Apply water once per hour; or
- (h) Install temporary covers.

Source: (4) Paved Road Track-Out

CONTROL MEASURES

DESCRIPTION

- | | |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Q) Chemical stabilization | (1) Most effective when used on areas where active operations have ceased.
(2) Vendors can supply information on methods for application and required concentrations. |
| (R) Sweep/clean roadways | (1) Either sweeping or water flushing may be used. |
| (S) Cover haul vehicles | (1) Entire surface area should be covered once vehicle is full. |
| (T) Bedliners in haul vehicles | (1) When feasible, use in bottom dumping vehicles. |
| (U) Site access improvement | (1) Pave internal roadway system.
(2) Most important segment, last 100 yards from the connection with paved public roads |

HIGH WIND MEASURE

- (i) Cover all haul vehicles; and
- (i) Clean streets with water flushing, unless prohibited by the Regional Water Quality Control Board.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (S) Disturbed Surface Areas/ Inactive Construction Sites

CONTROL MEASURES

DESCRIPTION

- (Q) Chemical stabilization
 - (1) Most effective when used on areas where active operations have ceased.
 - (2) Vendors can supply information on methods for application and required concentrations.
- (R) Watering
 - (1) Requires frequent applications unless a surface crust can be developed.
- (S) Wind fencing
 - (1) Three- to five-foot barriers with 50% or less porosity adjacent to roadways or urban areas can be effective in reducing the amount of wind blown material leaving a site.
- (T) Vegetation
 - (1) Establish as quickly as possible when active operations have ceased.
 - (2) Use of drought tolerant, native vegetation is encouraged.

HIGH WIND MEASURES

- (k) Apply chemical stabilizers (to meet the specifications established by the Rule); or
- (l) Apply water to all disturbed surface areas 3 times per day.

RULE 403 IMPLEMENTATION HANDBOOK

BEST AVAILABLE CONTROL MEASURES

Rule 403, paragraph (d)(2) requires active operations [defined in Rule 403, paragraph (c)(1)] within the South Coast Air Basin (see Figure 2-1) to implement at least one best available control measure for each fugitive dust source type on site. Additionally, as specified by subparagraph (f)(3)(D) of Rule 403, any person seeking approval of a fugitive dust emissions control plan for projects within the South Coast Air Basin must demonstrate to the satisfaction of the AQMD that the given activity is employing all best available fugitive dust control measures.

The AQMD has prepared the attached listing of best available fugitive dust control measures for a variety of source categories. This list is based on the U.S. Environmental Protection Agency's reference document entitled, "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures," Office of Air and Radiation, September 1992.

The AQMD encourages the use of those dust control measures that minimize the use of potable water. When water is needed, reclaimed water should be utilized to the greatest extent feasible.

RULE 403 IMPLEMENTATION HANDBOOK

BEST AVAILABLE CONTROL MEASURES

The left column contains a listing of the sources of fugitive dust which are intended for emission control under District Rule 403 and a listing of control measures and high-wind measures. The right column contains a description of the best available fugitive dust control measures for each of the sources.

Source: (1) Land Clearing/Earth-Moving

CONTROL MEASURES

DESCRIPTION

- | | |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (A) Watering (pre-grading) | (1) Application of water by means of trucks, hoses and/or sprinklers prior to conducting any land clearing. This will increase the moisture content of the soils; thereby increasing its stability. |
| (A-1) Watering (post-grading) | (2) Pre-application of water to depths of proposed cuts. |
| (A-2) Pre-grading planning | (1) In active earth-moving areas water should be applied at sufficient frequency and quantity to prevent visible emissions from extending more than 100 feet from the point of origin. |
| (B) Chemical stabilizers | (1) Grade each phase separately, timed to coincide with construction phase; or
(2) Grade entire project, but apply chemical stabilizers or ground cover to graded areas where construction phase begins more than 60 days after grading phase ends. |
| (C) Wind fencing | (1) Only effective in areas which are not subject to daily disturbances.
(2) Vendors can supply information on product application and required concentrations to meet the specifications established by the Rule. |
| (D) Cover haul vehicles | (1) Three- to five-foot barriers with 50% or less porosity located adjacent to roadways or urban areas can be effective in reducing the amount of windblown material leaving a site. Must be implemented in conjunction with either measure (A-1) or (B). |
| (E) Bedliners in haul vehicles | (1) Entire surface area of hauled earth should be covered once vehicle is full.
(1) When feasible, use in bottom-dumping haul vehicles. |

HIGH WIND MEASURE

- (a) Cease all active operations; or
- (b) Apply water within 15 minutes to any soil surface which is being moved or otherwise disturbed.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (2) Unpaved Roads

CONTROL MEASURES

DESCRIPTION

- | | |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (F) Paving | (1) Requires street sweeping/cleaning if subject to material accumulation. |
| (G) Chemical stabilization | (1) Vendors can supply information as to application methods and concentrations to meet the specifications established by the Rule
(2) Not recommended for high volume or heavy equipment traffic use. |
| (H) Watering | (1) In sufficient quantities to keep surface moist.
(2) Required application frequency will vary according to soil type, weather conditions, and vehicular use. |
| (I) Reduce speed limits | (1) 15 mile per hour maximum. May need to be used in conjunction with watering or chemical stabilization to prevent visible emissions from crossing the property line. |
| (J) Reduce vehicular trips | (1) Access restriction or redirecting traffic to reduce vehicle trips by a minimum of 60 percent. |
| (K) Gravel | (1) Gravel maintained to a depth of four inches can be an effective measure.
(2) Should only be used in areas where paving, chemical stabilization or frequent watering is not feasible. |

HIGH WIND MEASURE

- (a) Apply a chemical stabilizer (to meet the specifications established by the Rule) prior to wind events; or
 (b) Apply water once each hour; or
 (c) Stop all vehicular traffic.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (3) Storage Piles

CONTROL MEASURES

DESCRIPTION

- (L) Wind sheltering
- (1) Enclose in silos.
 - (2) Install three-sided barriers equal to height of material, with no more than 50 percent porosity.
- (M) Watering
- (1) Application methods include: spray bars, hoses and water trucks.
 - (2) Frequency of application will vary on site-specific conditions.
- (N) Chemical stabilizers
- (1) Best for use on storage piles subject to infrequent disturbances.
- (O) Altering load-in/load-out procedures
- (1) Confine load-in/load-out procedures to leeward (downwind) side of the material.
Must be used in conjunction with either measure (L), (M), (N), or (P).
- (P) Coverings
- (1) Tarps, plastic, or other material can be used as a temporary covering.
 - (2) When used, these should be anchored to prevent wind from removing coverings.

HIGH WIND MEASURE

- (a) Apply chemical stabilizers (to meet the specifications established by the Rule) prior to wind events; or
- (b) Apply water once per hour; or
- (c) Install temporary covers.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (4) Paved Road Track-Out

CONTROL MEASURES

DESCRIPTION

Compliance with District Rule 403.

Paragraph (d)(5).

January 1999

RULE 403 IMPLEMENTATION HANDBOOK

Source: (S) Disturbed Surface Areas/ Inactive Construction Sites

CONTROL MEASURES

DESCRIPTION

- | | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Q) Chemical stabilization | (1) Most effective when used on areas where active operations have ceased. |
| (R) Watering | (2) Vendors can supply information on methods for application and required concentrations. |
| (S) Wind fencing | (1) Requires frequent applications unless a surface crust can be developed. |
| (T) Vegetation | (1) Three- to five-foot barriers with 50% or less porosity adjacent to roadways or urban areas can be effective in reducing the amount of wind blown material leaving a site. Must be used in conjunction with either measure (Q), (R), or (T). |
| | (1) Establish as quickly as possible when active operations have ceased.* |

HIGH WIND MEASURES

- (a) Apply chemical stabilizers (to meet the specifications established by the Rule); or
- (b) Apply water to all disturbed surface areas 3 times per day.

* Use of drought tolerant, native vegetation is encouraged.

TABLE 1

BEST [REASONABLY]* AVAILABLE CONTROL MEASURES FOR HIGH WIND CONDITIONS

FUGITIVE DUST SOURCE CATEGORY	<u>CONTROL MEASURES</u>
Earth-moving	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	(0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR (1B) Apply chemical stabilizers prior to wind event; OR (2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR (3B) Take the actions specified in Table 2, Item (3c); OR (4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	(1C) Apply chemical stabilizers prior to wind event; OR (2C) Apply water twice [once] per hour during active operation; OR (3C) Stop all vehicular traffic.
Open storage piles	(1D) Apply water twice [once] per hour; OR (2D) Install temporary coverings.
Paved road track-out	(1E) Cover all haul vehicles; OR (2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	(1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 1 may be used.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2
DUST CONTROL ACTIONS FOR EXEMPTION FROM PARAGRAPH (d)(4)*

<u>FUGITIVE DUST SOURCE CATEGORY</u>	<u>CONTROL ACTIONS</u>
Earth-moving (except construction cutting and filling areas, and mining operations)	<p>(1a) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR</p> <p>(1a-1) For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.</p>
Earth-moving: Construction fill areas:	<p>(1b) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.</p>

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2 (Continued)*

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS
Earth-moving: Construction cut areas and mining operations:	(1c) Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	(2a/b) Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 [70] percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	(2c) Apply chemical stabilizers within five working days of grading completion; OR (2d) Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(3a) Apply water to at least 80 [70] percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR (3b) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR (3c) Establish a vegetative ground cover within 21 [30] days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR (3d) Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2 (Continued)*

<u>FUGITIVE DUST</u> <u>SOURCE CATEGORY</u>	<u>CONTROL ACTIONS</u>
Unpaved Roads	(4a) Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR (4b) Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR (4c) Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a) Apply chemical stabilizers; OR (5b) Apply water to at least 80 [70] percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR (5c) Install temporary coverings; OR (5d) Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
<u>All Categories</u>	(6a) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

AQMD Recommendations
TABLE 3
TRACK-OUT CONTROL OPTIONS
PARAGRAPH (d)(5)(B)

CONTROL OPTIONS

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

Appendix B
Standard Plan List
and
Reference Drawings

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 project plans.

ABBREVIATIONS, LINES, SYMBOLS AND LEGEND

A10A	Abbreviations (Sheet 1 of 2)
RSP A10B	Abbreviations (Sheet 2 of 2)
A10C	Lines and Symbols (Sheet 1 of 3)
A10D	Lines and Symbols (Sheet 2 of 3)
A10E	Lines and Symbols (Sheet 3 of 3)
A10F	Legend - Soil (Sheet 1 of 2)
A10G	Legend - Soil (Sheet 2 of 2)

PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS

A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
RSP A20C	Pavement Markers and Traffic Lines, Typical Details
A20D	Pavement Markers and Traffic Lines, Typical Details
RSP A24A	Pavement Markings - Arrows
A24B	Pavement Markings - Arrows and Symbols
RSP A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
RSP A24F	Pavement Markings - Crosswalks

RUMBLE STRIP

A40B	Shoulder Rumble Strip Details - Ground-In Indentations
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EXCAVATION AND BACKFILL

A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62C	Limits of Payment for Excavation and Backfill - Bridge
A62D	Excavation and Backfill - Concrete Pipe Culverts
A62DA	Excavation and Backfill - Concrete Pipe Culverts - Indirect Design Method
A62E	Excavation and Backfill - Cast-In-Place Reinforced Concrete Box and Arch Culverts
A62F	Excavation and Backfill - Metal and Plastic Culverts

OBJECT MARKERS, DELINEATORS, CHANNELIZERS AND BARRICADES

A73A	Object Markers
A73B	Markers
A73C	Delineators, Channelizers and Barricades

CONCRETE BARRIER TYPE 60 SERIES

A76A	Concrete Barrier Type 60
A76B	Concrete Barrier Type 60
A76F	Concrete Barrier Type 60GE

MIDWEST GUARDRAIL SYSTEM STANDARD RAILING SECTIONS

RSP A77L1	Midwest Guardrail System Standard Railing Section (Wood Post with Wood Block)
RSP A77M1	Midwest Guardrail System Standard Hardware
RSP A77N1	Midwest Guardrail System Wood Post and Wood Block Details
RSP A77N3	Midwest Guardrail System Typical Line Post Embedment and Hinge Point

	Offset Details
RSP A77N4	Midwest Guardrail System Typical Railing Delineation and Dike Positioning Details
	MIDWEST GUARDRAIL SYSTEM TYPICAL VEGETATION CONTROL
RSP A77N5	Midwest Guardrail System Typical Vegetation Control Standard Railing Section
RSP A77N6	Midwest Guardrail System Typical Vegetation Control for Terminal System End Treatments
RSP A77N7	Midwest Guardrail System Typical Vegetation Control at Structure Approach
RSP A77N8	Midwest Guardrail System Typical Vegetation Control at Fixed Object
	MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR EMBANKMENTS
RSP A77P1	Midwest Guardrail System Typical Layouts for Embankments
RSP A77P5	Midwest Guardrail System Typical Layouts for Embankments
	MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR STRUCTURES
RSP A77Q1	Midwest Guardrail System Typical Layouts for Structure Approach
	MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR FIXED OBJECTS
RSP A77R3	Midwest Guardrail System Typical Layouts for Roadside Fixed Objects
	MIDWEST GUARDRAIL SYSTEM END ANCHORAGE AND RAIL TENSIONING ASSEMBLY
RSP A77S1	Midwest Guardrail System End Anchor Assembly (Type SFT)
RSP A77S2	Midwest Guardrail System Rail Tensioning Assembly
RSP A77S3	Metal Railing Anchor Cable and Anchor Plate Details
	MIDWEST GUARDRAIL SYSTEM CONNECTION DETAILS AND TRANSITION RAILING TO BRIDGE RAILINGS, ABUTMENTS AND WALLS
RSP A77U1	Midwest Guardrail System Connections to Bridge Railings without Sidewalks Details No. 1
RSP A77U2	Midwest Guardrail System Connections to Bridge Railings without Sidewalks Details No. 2
RSP A77U4	Midwest Guardrail System Transition Railing (Type WB-31)
RSP A77V1	Midwest Guardrail System Connections to Bridge Railings with Sidewalks Details No. 1
RSP A77V2	Midwest Guardrail System Connections to Bridge Railings with Sidewalks Details No. 2
	FENCES
A85	Chain Link Fence
A85A	Chain Link Fence Details
RSP A85B	Chain Link Fence Details
	CURBS, DRIVEWAYS, DIKES, CURB RAMPS AND ACCESSIBLE PARKING
RSP A87A	Curbs and Driveways
RSP A88A	Curb Ramp Details
RSP A88B	Curb Ramp and Island Passageway Details
	PAVEMENTS
RSP P1	Jointed Plain Concrete Pavement New Construction
RSP P2	Jointed Plain Concrete Pavement (Widened Lane) New Construction
RSP P10	Concrete Pavement Dowel Bar Details
RSP P12	Concrete Pavement Dowel Bar Basket Details
RSP P15	Concrete Pavement - Tie Bar Details
RSP P17	Concrete Pavement Tie Bar Basket Details
RSP P18	Concrete Pavement Lane Schematics and Isolation Joint Detail
RSP P20	Joint Seals
RSP P30	Concrete Pavement - End Panel Pavement Transitions

P33	Concrete Pavement - Lane Drop Paving Details No. 1
P35	Concrete Pavement - Ramp Transition Paving Details
P45	Concrete Pavement - Drainage Inlet Details No. 1
P46	Concrete Pavement - Drainage Inlet Details No. 2
RSP P74	Pavement Edge Treatments
RSP P76	Pavement Edge Treatments - New Construction
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D71	Drainage Inlet Markers
D72	Drainage Inlets
RSP D73	Drainage Inlets
D74A	Drainage Inlets
D74B	Drainage Inlets
D74C	Drainage Inlet Details
D75B	Concrete Pipe Inlets
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RSP D77A	Grate Details No. 1
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D78A	Gutter Depressions
D78B	Inlet Depressions - Concrete Shoulders
D78C	Inlet Depressions - Hot Mix Asphalt Shoulders
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D80	Cast-In-Place Reinforced Concrete - Single Box Culvert
D82	Cast-In-Place Reinforced Concrete Box Culvert - Miscellaneous Details
D84	Box Culvert Wingwalls - Types A, B and C
D86A	Box Culvert Warped Wingwalls
PIPE AND ARCH CULVERT - ENDWALLS AND WARPED WINGWALLS	
D86B	Pipe Culvert Headwalls, Endwalls and Warped Wingwalls
PIPE DOWNDRAINS, ANCHORAGE SYSTEMS AND OVERSIDE DRAINS	
D87D	Overside Drains
CONSTRUCTION LOADS ON CULVERTS AND STRUT DETAILS	
D88	Construction Loads on Culverts
PIPE CULVERT HEADWALLS, ENDWALLS, WINGWALLS AND JUNCTION STRUCTURE	
D89	Pipe Culvert Headwalls - Straight and "L"
D91A	Cast-In-Place Reinforced Concrete - Junction Structure
D91B	Cast-In-Place Reinforced Concrete - Junction Structure
FLARED END SECTIONS	
D94A	Metal and Plastic Flared End Sections
PIPE COUPLING AND JOINT DETAILS	
D97A	Corrugated Metal Pipe Coupling Details No. 1 - Annular Coupling Band Bar and Strap and Angle Connections
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D97D	Corrugated Metal Pipe Coupling Details No. 4 - Hugger Coupling Bands
D97E	Corrugated Metal Pipe Coupling Details No. 5 - Standard Joint
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RSP H1	Landscape and Erosion Control Abbreviations
RSP H2	Landscape and Erosion Control Symbols
H3	Landscape Details
RSP H4	Landscape Details
RSP H5	Landscape Details
RSP H6	Landscape Details
RSP H7	Landscape Details
RSP H8	Landscape Details
RSP H9	Landscape Details
RSP H9A	Landscape Details
H10	Irrigation Controller Enclosure Cabinet
H51	Erosion Control Details - Fiber Roll and Compost Sock
H52	Rolled Erosion Control Product

TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN

T1A	Temporary Crash Cushion, Sand Filled (Unidirectional)
T1B	Temporary Crash Cushion, Sand Filled (Bidirectional)
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3A	Temporary Railing (Type K)
T3B	Temporary Railing (Type K)
T4	Temporary Traffic Screen

TEMPORARY TRAFFIC CONTROL SYSTEMS

RSP T9	Traffic Control System Tables for Lane and Ramp Closures
RSP T10	Traffic Control System for Lane Closure on Freeways and Expressways
RSP T10A	Traffic Control System for Lane Closures on Freeways and Expressways
RSP T11	Traffic Control System for Lane Closure on Multilane Conventional Highways
RSP T12	Traffic Control System for Half Road Closure on Multilane Conventional Highways and Expressways
RSP T14	Traffic Control System for Ramp Closure

TEMPORARY WATER POLLUTION CONTROL

T51	Temporary Water Pollution Control Details (Temporary Silt Fence)
T53	Temporary Water Pollution Control Details (Temporary Cover)
T55	Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T57	Temporary Water Pollution Control Details (Temporary Check Dam)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
T62	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T64	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T65	Temporary Water Pollution Control Details [Temporary Fence (Type ESA)]
T67	Temporary Water Pollution Control Details (Temporary Construction Roadway)

BRIDGE DETAILS

B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details
B0-13	Bridge Details

PILES

B2-3	16" and 24" Cast-In-Drilled-Hole Concrete Pile
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RETAINING WALLS

RSP B3-1A	Retaining Wall Type 1 (Case 1)
RSP B3-1B	Retaining Wall Type 1 (Case 2)
RSP B3-5	Retaining Wall Details No. 1
B3-6	Retaining Wall Details No. 2

T-BEAM DETAILS

B6-10	Utility Openings, T-Beam
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JOINT SEALS

B6-21	Joint Seals (Maximum Movement Rating = 2")
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BOX GIRDER DETAILS

B7-1	Box Girder Details
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DECK DRAINS

B7-6	Deck Drains - Types D-1 and D-2
B7-8	Deck Drainage Details

UTILITY OPENING

B7-10	Utility Opening - Box Girder
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CAST-IN-PLACE POST-TENSIONED GIRDER

RSP B8-5	Cast-In-Place Post-Tensioned Girder Details
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CHAIN LINK RAILING, CABLE RAILING AND TUBULAR HAND RAILING

RSP B11-47	Cable Railing
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BRIDGE CONCRETE BARRIERS

RSP B11-54	Concrete Barrier Type 26
RSP B11-55	Concrete Barrier Type 732
RSP B11-56	Concrete Barrier Type 736

COMMUNICATION AND SPRINKLER CONTROL CONDUITS (BRIDGE)

B14-3	Communication and Sprinkler Control Conduits (Conduit Less Than 4")
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WATER SUPPLY LINE (BRIDGE)

B14-4	Water Supply Line (Bridge) (Pipe Sizes Less Than 4")
B14-5	Water Supply Line (Details) (Pipe Sizes Less Than 4")

ROADSIDE SIGNS

RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS3	Roadside Signs - Laminated Wood Box Post Typical Installation Details No. 3
RS4	Roadside Signs, Typical Installation Details No. 4

OVERHEAD SIGNS (TRUSS)

RSP S1	Overhead Signs - Truss, Instructions and Examples
RSP S2	Overhead Signs - Truss, Single Post Type - Post Types II thru IX
S3	Overhead Signs - Truss, Single Post Type - Base Plate and Anchorage Details
S4	Overhead Signs - Truss, Single Post Type - Structural Frame Members Details No. 1
S5	Overhead Signs - Truss, Single Post Type - Structural Frame Members Details No. 2
S6	Overhead Signs - Truss, Gusset Plate Details

S8	Overhead Signs - Truss, Single Post Type - Round Pedestal Pile Foundation
S12	Overhead Signs - Truss, Structural Frame Details
S13	Overhead Signs - Truss, Frame Juncture Details
S16	Overhead Signs - Walkway Details No. 1
S17	Overhead Signs - Walkway Details No. 2
S17A	Overhead Signs - Walkway Details No. 3
S18	Overhead Signs - Walkway Safety Railing Details
S19	Overhead Signs - Truss, Sign Mounting Details - Laminated Panel - Type A
OVERHEAD AND ROADSIDE SIGNS PANELS	
S81	Overhead Laminated Sign - Single or Multiple Panel, Type A (1" Thick)
S86	Laminated Panel Details - Extrusions for Type A, B and H Panels
S87	Type A-1 Mounting Hardware - Overhead Laminated Type A Panel, Truss and Lightweight Sign Structures
S93	Framing Details for Framed Single Sheet Aluminum Signs, Rectangular Shape
S94	Roadside Framed Single Sheet Aluminum Signs, Rectangular Shape
S95	Roadside Single Sheet Aluminum Signs, Diamond Shape
ELECTRICAL SYSTEMS - LEGEND AND ABBREVIATIONS	
RSP ES-1A	Electrical Systems (Legend and Abbreviations)
RSP ES-1B	Electrical Systems (Legend and Abbreviations)
RSP ES-1C	Electrical Systems (Legend and Abbreviations)
ELECTRICAL SYSTEMS - SERVICE EQUIPMENT AND WIRING DIAGRAMS	
ES-2A	Electrical Systems (Service Equipment)
ES-2C	Electrical Systems (Service Equipment Notes, Type III Series)
ES-2E	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III - B Series)
ES-2F	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram Type III - C Series)
ELECTRICAL SYSTEMS - CONTROLLER CABINETS	
ES-3B	Electrical Systems (Controller Cabinet Adapter Details)
ES-3C	Electrical Systems (Controller Cabinet Foundation Details)
ELECTRICAL SYSTEMS - IRRIGATION CONTROLLER ENCLOSURE CABINET	
ES-3H	Electrical Systems (Irrigation Controller Enclosure Cabinet)
ELECTRICAL SYSTEMS - SIGNAL HEADS, SIGNAL FACES AND MOUNTINGS	
RSP ES-4A	Electrical Systems (Vehicular Signal Heads and Mountings)
RSP ES-4B	Electrical Systems (Pedestrian Signal and Ramp Metering Sign)
RSP ES-4C	Electrical Systems (Vehicular Signal Heads and Mountings)
ES-4D	Electrical Systems (Signal Mounting)
RSP ES-4E	Electrical Systems (Vehicular Signal Heads and Optical Detector Mounting)
ELECTRICAL SYSTEMS - DETECTORS	
ES-5A	Electrical Systems (Detectors)
RSP ES-5B	Electrical Systems (Detectors)
RSP ES-5C	Electrical Systems (Accessible Pedestrian Signal, Push Button Assemblies and Magnetic Vehicle Detector)
RSP ES-5D	Electrical Systems (Curb Termination and Handhole)
ELECTRICAL SYSTEMS - LIGHTING STANDARDS	
ES-6A	Electrical Systems (Lighting Standard, Types 15 and 21)
ES-6B	Electrical Systems (Electrolier Anchorage and Grouting for Types 15 and 21, Barrier Rail Mounted)
ES-6E	Electrical Systems (Lighting Standard, Types 30 and 31)

ES-6F	Electrical Systems (Lighting Standard, Slip Base Plate) ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD, TYPE TS, AND PEDESTRIAN PUSH BUTTON POST
RSP ES-7A	Electrical Systems (Signal and Lighting Standard, Type TS, and Push Button Assembly Post) ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARDS
ES-7B	Electrical Systems (Signal and Lighting Standard - Type 1 and Equipment Numbering)
RSP ES-7E	Electrical Systems (Signal and Lighting Standard, Case 3 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 15' to 45')
RSP ES-7F	Electrical Systems (Signal and Lighting Standard, Case 4 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 25' to 45')
RSP ES-7G	Electrical Systems (Signal And Lighting Standard, Case 5 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 50' to 55')
RSP ES-7H	Electrical Systems (Signal and Lighting Standard, Case 5 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 60' to 65') ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD DETAILS
ES-7M	Electrical Systems (Signal and Lighting Standard - Detail No. 1)
ES-7N	Electrical Systems (Signal and Lighting Standard - Detail No. 2)
ES-7O	Electrical Systems (Signal and Lighting Standard - Detail No. 3) ELECTRICAL SYSTEMS - PEDESTRIAN BARRICADES
ES-7Q	Electrical Systems (Pedestrian Barricades) ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING, MISCELLANEOUS ATTACHMENT
RSP ES-7R	Electrical Systems (Signal and Lighting, Miscellaneous Attachment) ELECTRICAL SYSTEMS - PULL BOX
RSP ES-8A	Electrical Systems (Non-Traffic Pull Box)
RSP ES-8B	Electrical Systems (Traffic Pull Box) ELECTRICAL SYSTEMS - STRUCTURE INSTALLATIONS
ES-9A	Electrical Systems (Structure Pull Box Installations)
ES-9B	Electrical Systems (Conduit Riser and Expansion Fitting, Structure Installations)
ES-9C	Electrical Systems (Structure Pull Box)
ES-9D	Electrical Systems (Structure Pull Box Installations) ELECTRICAL SYSTEMS - ISOFOOTCANDLE DIAGRAMS AND FOUNDATION DETAILS
RSP ES-10A	Electrical Systems (Isofootcandle Diagrams)
RSP ES-11	Electrical Systems (Foundation Installations) ELECTRICAL SYSTEMS - SPLICING, FUSE RATING, KINKING AND BANDING DETAILS
ES-13A	Electrical Systems (Splicing Details)
ES-13B	Electrical Systems (Fuse Rating, Kinking and Banding Detail) ELECTRICAL SYSTEMS - SIGN ILLUMINATION EQUIPMENT AND CONTROLS
ES-15A	Electrical Systems (Sign Illumination Equipment)
ES-15B	Electrical Systems (36" Fluorescent Sign Illumination Equipment)
ES-15C	Electrical Systems (Sign Illumination Equipment)
ES-15D	Electrical Systems (Lighting and Sign Illumination Control)

Appendix C

Attachment “C” for Risk Level 1 Requirements

ATTACHMENT C RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:
 - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
 - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:
 - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
 - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
 - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
 - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
 - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
 - d. Cover waste disposal containers at the end of every business day and during a rain event.
 - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
 - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
 - g. Implement procedures that effectively address hazardous and non-hazardous spills.
 - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
 - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

- ii. Appropriate spill response personnel are assigned and trained.
 - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
 - a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
 - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
 - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
 - a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
 - b. Contain fertilizers and other landscape materials when they are not actively being used.
 - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
 - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
 - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
 - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
 - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
 - d. Ensure retention of sampling, visual observation, and inspection records.
 - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.
2. Risk Level 1 dischargers shall provide effective soil cover for inactive¹ areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

¹ Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
 - a. Inspection date and date the inspection report was written.
 - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
 - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
 - d. A description of any BMPs evaluated and any deficiencies noted.
 - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
 - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
 - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
 - h. Photographs taken during the inspection, if any.
 - i. Inspector's name, title, and signature.

H. Rain Event Action Plan
Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1 - Summary of Monitoring Requirements

Risk Level	Visual Inspection					Sample Collection	
	Quarterly non-Storm Water Discharge	Pre-Storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
 - c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
 - d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.
- 3. Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**
- a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
 - b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
 - c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.
 - d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
 - e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):
 - i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
 - ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

- iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. Risk Level 1 – Visual Observation Exemptions

- a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:
 - i. During dangerous weather conditions such as flooding and electrical storms.
 - ii. Outside of scheduled site business hours.
- b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. Risk Level 1 – Monitoring Methods

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements

- a. Visual Monitoring Requirements:
 - i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
 - ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
 - iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. Risk Level 1 – Non-Visible Pollutant Monitoring Requirements

- a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

- f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.²
- h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. Risk Level 1 – Particle Size Analysis for Project Risk Justification

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. Risk Level 1 – Records

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.

² For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).
- i. Visual observation and sample collection exception records (see Section I.4 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

Appendix D

Federal Prevailing Wage Decision

APPENDIX D
Federal Prevailing Wage Decision

General Decision Number: CA140036 08/22/2014 CA36

Superseded General Decision Number: CA20130036

State: California

Construction Types: Building, Heavy (Heavy and Dredging) and Highway

County: Riverside County in California.

BUILDING CONSTRUCTION PROJECTS; DREDGING PROJECTS (does not include hopper dredge work); HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/03/2014
1	01/10/2014
2	01/24/2014
3	02/21/2014
4	03/07/2014
5	03/14/2014
6	05/09/2014
7	05/16/2014
8	05/23/2014
9	06/06/2014
10	06/13/2014
11	06/20/2014
12	07/04/2014
13	07/11/2014
14	07/18/2014
15	07/25/2014
16	08/01/2014
17	08/08/2014
18	08/22/2014

ASBE0005-002 06/30/2014

	Rates	Fringes
Asbestos Workers/Insulator (Includes the application of all insulating materials, protective coverings, coatings, and finishes to all types of mechanical systems).....	\$ 35.44	19.36
Fire Stop Technician (Application of Firestopping Materials for wall openings and penetrations in walls, floors, ceilings and curtain walls).....	\$ 24.34	16.09

ASBE0005-004 06/24/2013

	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)....\$ 16.95 10.23

BOIL0092-003 10/01/2012

	Rates	Fringes
BOILERMAKER.....	\$ 41.17	28.27

* BRCA0004-011 05/01/2014

	Rates	Fringes
BRICKLAYER; MARBLE SETTER.....	\$ 36.96	12.37

*The wage scale for prevailing wage projects performed in Blythe, China lake, Death Valley, Fort Irwin, Twenty-Nine Palms, Needles and 1-15 corridor (Barstow to the Nevada State Line) will be Three Dollars (\$3.00) above the standard San Bernardino/Riverside County hourly wage rate

BRCA0018-004 06/01/2014

	Rates	Fringes
MARBLE FINISHER.....	\$ 28.45	11.38
TILE FINISHER.....	\$ 23.78	9.84
TILE LAYER.....	\$ 35.14	14.33

BRCA0018-010 09/01/2013

	Rates	Fringes
TERRAZZO FINISHER.....	\$ 26.59	10.34
TERRAZZO WORKER/SETTER.....	\$ 33.63	11.13

CARP0409-001 07/01/2010

	Rates	Fringes
CARPENTER		
(1) Carpenter, Cabinet Installer, Insulation Installer, Hardwood Floor Worker and acoustical installer.....	\$ 37.35	11.08
(2) Millwright.....	\$ 37.85	11.08
(3) Piledrivermen/Derrick Bargeman, Bridge or Dock Carpenter, Heavy Framer, Rock Bargeman or Scowman, Rockslinger, Shingler (Commercial).....	\$ 37.48	11.08
(4) Pneumatic Nailer, Power Stapler.....	\$ 37.60	11.08
(5) Sawfiler.....	\$ 37.44	11.08
(6) Scaffold Builder.....	\$ 28.55	11.08
(7) Table Power Saw Operator.....	\$ 37.45	11.08

FOOTNOTE: Work of forming in the construction of open cut sewers or storm drains, on operations in which horizontal lagging is used in conjunction with steel H-Beams driven or placed in pre- drilled holes, for that portion of a lagged trench against which concrete is poured, namely, as a

substitute for back forms (which work is performed by piledrivers): \$0.13 per hour additional.

 CARP0409-002 07/01/2008

	Rates	Fringes
Diver		
(1) Wet.....	\$ 663.68	9.82
(2) Standby.....	\$ 331.84	9.82
(3) Tender.....	\$ 323.84	9.82
(4) Assistant Tender.....	\$ 299.84	9.82

Amounts in "Rates" column are per day

 CARP0409-005 07/01/2010

	Rates	Fringes
Drywall		
DRYWALL INSTALLER/LATHER....	\$ 37.35	11.08
STOCKER/SCRAPPER.....	\$ 10.00	6.67

 CARP0409-008 08/01/2010

	Rates	Fringes
Modular Furniture Installer.....	\$ 17.00	7.41

 ELEC0440-001 05/26/2014

	Rates	Fringes
ELECTRICIAN		
INSIDE ELECTRICIAN.....	\$ 36.09	3%+19.55
INTELLIGENT TRANSPORTATION SYSTEMS		
Electrician.....	\$ 36.09	3%+19.55
Technician.....	\$ 27.07	3%+19.55

ZONE PAY: Zone A: Free travel zone for all contractors performing work in Zone A.

Zone B: Any work performed in Zone (B) shall add \$12.00 per hour to the current wage scale. Zone (B) shall be the area from the eastern perimeter of Zone (A) to a line which runs north and south beginning at Little Morongo Canyon (San Bernardino/Riverside County Line), Southeast along the Coachella Tunnels, Colorado River Aqueduct and Mecca Tunnels to Pinkham Wash then South to Box Canyon Road, then southwest along Box Canyon Road to Highway 195 west onto 195 south to Highway 86 to Riverside/Imperial County Line.

 ELEC0440-004 05/26/2014

COMMUNICATIONS AND SYSTEMS WORK

	Rates	Fringes
Communications System		
Installer.....	\$ 28.38	4%+11.45
Technician.....	\$ 30.18	4%+11.45

SCOPE OF WORK:

Installation, testing, service and maintenance of systems utilizing the transmission and/or transference of voice, sound, vision and digital for commercial, educational, 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 systems, radio page, school intercom and sound, burglar alarms, fire alarms, and low voltage master clock systems in commercial buildings. Communication Systems that transmit or receive information and/or control systems that are intrinsic to the above listed systems; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding all other data systems or multiple systems which include control function or power supply; excluding installation of raceway systems, conduit systems, line voltage work, and energy management systems. Does not cover work performed at China Lake Naval Ordnance Test Station.

 ELEC1245-001 06/01/2013

	Rates	Fringes
LINE CONSTRUCTION		
(1) Lineman; Cable splicer..	\$ 50.30	15.00
(2) Equipment specialist (operates crawler tractors, commercial motor vehicles, backhoes, trenchers, cranes (50 tons and below), overhead & underground distribution line equipment).....	\$ 40.17	14.56
(3) Groundman.....	\$ 30.73	13.48
(4) Powderman.....	\$ 44.91	13.48

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

 ELEV0018-001 01/01/2014

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 49.03	26.785

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.

 ENGI0012-003 07/07/2014

	Rates	Fringes
OPERATOR: Power Equipment (All Other Work)		
GROUP 1.....	\$ 39.05	22.25
GROUP 2.....	\$ 39.83	22.25
GROUP 3.....	\$ 40.12	22.25
GROUP 4.....	\$ 41.61	22.25
GROUP 5.....	\$ 41.86	22.25
GROUP 6.....	\$ 41.83	22.25

GROUP 8.....	\$ 41.94	22.25
GROUP 9.....	\$ 42.19	22.25
GROUP 10.....	\$ 42.06	22.25
GROUP 11.....	\$ 42.31	22.25
GROUP 12.....	\$ 42.23	22.25
GROUP 13.....	\$ 42.33	22.25
GROUP 14.....	\$ 42.36	22.25
GROUP 15.....	\$ 42.44	22.25
GROUP 16.....	\$ 42.56	22.25
GROUP 17.....	\$ 42.73	22.25
GROUP 18.....	\$ 42.83	22.25
GROUP 19.....	\$ 42.94	22.25
GROUP 20.....	\$ 43.06	22.25
GROUP 21.....	\$ 43.23	22.25
GROUP 22.....	\$ 43.33	22.25
GROUP 23.....	\$ 43.44	22.25
GROUP 24.....	\$ 43.56	22.25
GROUP 25.....	\$ 43.73	22.25
OPERATOR: Power Equipment (Cranes, Piledriving & Hoisting)		
GROUP 1.....	\$ 40.40	22.25
GROUP 2.....	\$ 41.18	22.25
GROUP 3.....	\$ 41.47	22.25
GROUP 4.....	\$ 41.61	22.25
GROUP 5.....	\$ 41.83	22.25
GROUP 6.....	\$ 41.94	22.25
GROUP 7.....	\$ 42.06	22.25
GROUP 8.....	\$ 42.23	22.25
GROUP 9.....	\$ 42.40	22.25
GROUP 10.....	\$ 43.40	22.25
GROUP 11.....	\$ 44.40	22.25
GROUP 12.....	\$ 45.40	22.25
GROUP 13.....	\$ 46.40	22.25
OPERATOR: Power Equipment (Tunnel Work)		
GROUP 1.....	\$ 40.90	22.25
GROUP 2.....	\$ 41.68	22.25
GROUP 3.....	\$ 41.97	22.25
GROUP 4.....	\$ 42.11	22.25
GROUP 5.....	\$ 42.33	22.25
GROUP 6.....	\$ 42.44	22.25
GROUP 7.....	\$ 42.56	22.25

PREMIUM PAY:

\$3.75 per hour shall be paid on all Power Equipment Operator work on the following Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton

Workers required to suit up and work in a hazardous material environment: \$2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.

SEE ZONE DEFINITIONS AFTER CLASSIFICATIONS

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Bargeman; Brakeman; Compressor operator; Ditch Witch, with seat or similar type equipment; Elevator operator-inside; Engineer Oiler; Forklift operator (includes loed, lull or similar types under 5 tons; Generator operator; Generator, pump or compressor plant operator; Pump operator; Signalman; Switchman

GROUP 2: Asphalt-rubber plant operator (nurse tank operator); Concrete mixer operator-skip type; Conveyor operator; Fireman; Forklift operator (includes loed, lull or similar types over 5 tons; Hydrostatic pump operator; oiler crusher (asphalt or concrete plant); Petromat laydown machine; PJU side dum jack; Screening and conveyor machine operator (or similar types); Skiploader (wheel type up to 3/4 yd. without attachment); Tar pot fireman; Temporary heating plant operator; Trenching machine oiler

GROUP 3: Asphalt-rubber blend operator; Bobcat or similar type (Skid steer); Equipment greaser (rack); Ford Ferguson (with dragtype attachments); Helicopter radioman (ground); Stationary pipe wrapping and cleaning machine operator

GROUP 4: Asphalt plant fireman; Backhoe operator (mini-max or similar type); Boring machine operator; Boxman or mixerman (asphalt or concrete); Chip spreading machine operator; Concrete cleaning decontamination machine operator; Concrete Pump Operator (small portable); Drilling machine operator, small auger types (Texoma super economatic or similar types - Hughes 100 or 200 or similar types - drilling depth of 30' maximum); Equipment greaser (grease truck); Guard rail post driver operator; Highline cableway signalman; Hydra-hammer-aero stomper; Micro Tunneling (above ground tunnel); Power concrete curing machine operator; Power concrete saw operator; Power-driven jumbo form setter operator; Power sweeper operator; Rock Wheel Saw/Trencher; Roller operator (compacting); Screed operator (asphalt or concrete); Trenching machine operator (up to 6 ft.); Vacuum or much truck

GROUP 5: Equipment Greaser (Grease Truck/Multi Shift).

GROUP 6: Articulating material hauler; Asphalt plant engineer; Batch plant operator; Bit sharpener; Concrete joint machine operator (canal and similar type); Concrete planer operator; Dandy digger; Deck engine operator; Derrickman (oilfield type); Drilling machine operator, bucket or auger types (Calweld 100 bucket or similar types - Watson 1000 auger or similar types - Texoma 330, 500 or 600 auger or similar types - drilling depth of 45' maximum); Drilling machine operator; Hydrographic seeder machine operator (straw, pulp or seed), Jackson track maintainer, or similar type; Kalamazoo Switch tamper, or similar type; Machine tool operator; Maginnis internal full slab vibrator, Mechanical berm, curb or gutter (concrete or asphalt); Mechanical finisher operator (concrete, Clary-Johnson-Bidwell or similar); Micro tunnel system (below ground); Pavement breaker operator (truck mounted); Road oil mixing machine operator; Roller operator (asphalt or finish), rubber-tired earth moving equipment (single engine, up to and including 25 yds. struck); Self-propelled tar pipelining machine operator; Skiploader operator

(crawler and wheel type, over 3/4 yd. and up to and including 1-1/2 yds.); Slip form pump operator (power driven hydraulic lifting device for concrete forms); Tractor operator-bulldozer, tamper-scraper (single engine, up to 100 h.p. flywheel and similar types, up to and including D-5 and similar types); Tugger hoist operator (1 drum); Ultra high pressure waterjet cutting tool system operator; Vacuum blasting machine operator

GROUP 8: Asphalt or concrete spreading operator (tamping or finishing); Asphalt paving machine operator (Barber Greene or similar type); Asphalt-rubber distribution operator; Backhoe operator (up to and including 3/4 yd.), small ford, Case or similar; Cast-in-place pipe laying machine operator; Combination mixer and compressor operator (gunite work); Compactor operator (self-propelled); Concrete mixer operator (paving); Crushing plant operator; Drill Doctor; Drilling machine operator, Bucket or auger types (Calweld 150 bucket or similar types - Watson 1500, 2000 2500 auger or similar types - Texoma 700, 800 auger or similar types - drilling depth of 60' maximum); Elevating grader operator; Grade checker; Gradall operator; Grouting machine operator; Heavy-duty repairman; Heavy equipment robotics operator; Kalamazoo balliste regulator or similar type; Kolman belt loader and similar type; Le Tourneau blob compactor or similar type; Loader operator (Athey, Euclid, Sierra and similar types); Mobark Chipper or similar; Ozzie padder or similar types; P.C. slot saw; Pneumatic concrete placing machine operator (Hackley-Presswell or similar type); Pumpcrete gun operator; Rock Drill or similar types; Rotary drill operator (excluding caisson type); Rubber-tired earth-moving equipment operator (single engine, caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. up to and including 50 cu. yds. struck); Rubber-tired earth-moving equipment operator (multiple engine up to and including 25 yds. struck); Rubber-tired scraper operator (self-loading paddle wheel type-John Deere, 1040 and similar single unit); Self-propelled curb and gutter machine operator; Shuttle buggy; Skiploader operator (crawler and wheel type over 1-1/2 yds. up to and including 6-1/2 yds.); Soil remediation plant operator; Surface heaters and planer operator; Tractor compressor drill combination operator; Tractor operator (any type larger than D-5 - 100 flywheel h.p. and over, or similar-bulldozer, tamper, scraper and push tractor single engine); Tractor operator (boom attachments), Traveling pipe wrapping, cleaning and bending machine operator; Trenching machine operator (over 6 ft. depth capacity, manufacturer's rating); trenching Machine with Road Miner attachment (over 6 ft depth capacity): Ultra high pressure waterjet cutting tool system mechanic; Water pull (compaction) operator

GROUP 9: Heavy Duty Repairman

GROUP 10: Drilling machine operator, Bucket or auger types (Calweld 200 B bucket or similar types-Watson 3000 or 5000 auger or similar types-Texoma 900 auger or similar types-drilling depth of 105' maximum); Dual drum mixer, dynamic compactor LDC350 (or similar types); Monorail locomotive operator (diesel, gas or electric); Motor

patrol-blade operator (single engine); Multiple engine tractor operator (Euclid and similar type-except Quad 9 cat.); Rubber-tired earth-moving equipment operator (single engine, over 50 yds. struck); Pneumatic pipe ramming tool and similar types; Prestressed wrapping machine operator; Rubber-tired earth-moving equipment operator (single engine, over 50 yds. struck); Rubber tired earth moving equipment operator (multiple engine, Euclid, caterpillar and similar over 25 yds. and up to 50 yds. struck), Tower crane repairman; Tractor loader operator (crawler and wheel type over 6-1/2 yds.); Woods mixer operator (and similar Pugmill equipment)

GROUP 11: Heavy Duty Repairman - Welder Combination, Welder - Certified.

GROUP 12: Auto grader operator; Automatic slip form operator; Drilling machine operator, bucket or auger types (Calweld, auger 200 CA or similar types - Watson, auger 6000 or similar types - Hughes Super Duty, auger 200 or similar types - drilling depth of 175' maximum); Hoe ram or similar with compressor; Mass excavator operator less tha 750 cu. yards; Mechanical finishing machine operator; Mobile form traveler operator; Motor patrol operator (multi-engine); Pipe mobile machine operator; Rubber-tired earth- moving equipment operator (multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck); Rubber-tired self- loading scraper operator (paddle-wheel-auger type self-loading - two (2) or more units)

GROUP 13: Rubber-tired earth-moving equipment operator operating equipment with push-pull system (single engine, up to and including 25 yds. struck)

GROUP 14: Canal liner operator; Canal trimmer operator; Remote- control earth-moving equipment operator (operating a second piece of equipment: \$1.00 per hour additional); Wheel excavator operator (over 750 cu. yds.)

GROUP 15: Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 yds. struck); Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine-up to and including 25 yds. struck)

GROUP 16: Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (single engine, over 50 yds. struck); Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine, Euclid, Caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 17: Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine, Euclid, Caterpillar and similar, over 50 cu. yds. struck); Tandem tractor operator (operating crawler type tractors in tandem - Quad 9 and similar type)

GROUP 18: Rubber-tired earth-moving equipment operator,

operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, up to and including 25 yds. struck)

GROUP 19: Rotex concrete belt operator (or similar types); Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck); Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, up to and including 25 yds. struck)

GROUP 20: Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, over 50 yds. struck); Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps, and similar types in any combination, excluding compaction units - multiple engine, Euclid, Caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 21: Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck)

GROUP 22: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (single engine, up to and including 25 yds. struck)

GROUP 23: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 yds. struck); Rubber-tired earth-moving equipment operator, operating with the tandem push-pull system (multiple engine, up to and including 25 yds. struck)

GROUP 24: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (single engine, over 50 yds. struck); Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (multiple engine, Euclid, Caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 25: Concrete pump operator-truck mounted; Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck)

CRANES, PILEDIVING AND HOISTING EQUIPMENT CLASSIFICATIONS

GROUP 1: Engineer oiler; Fork lift operator (includes loed, lull or similar types)

GROUP 2: Truck crane oiler

GROUP 3: A-frame or winch truck operator; Ross carrier operator (jobsite)

GROUP 4: Bridge-type unloader and turntable operator; Helicopter hoist operator

GROUP 5: Hydraulic boom truck; Stinger crane (Austin-Western or similar type); Tugger hoist operator (1 drum)

GROUP 6: Bridge crane operator; Cretor crane operator; Hoist operator (Chicago boom and similar type); Lift mobile operator; Lift slab machine operator (Vagtborg and similar types); Material hoist and/or manlift operator; Polar gantry crane operator; Self Climbing scaffold (or similar type); Shovel, backhoe, dragline, clamshell operator (over 3/4 yd. and up to 5 cu. yds. mrc); Tugger hoist operator

GROUP 7: Pedestal crane operator; Shovel, backhoe, dragline, clamshell operator (over 5 cu. yds. mrc); Tower crane repair; Tugger hoist operator (3 drum)

GROUP 8: Crane operator (up to and including 25 ton capacity); Crawler transporter operator; Derrick barge operator (up to and including 25 ton capacity); Hoist operator, stiff legs, Guy derrick or similar type (up to and including 25 ton capacity); Shovel, backhoe, dragline, clamshell operator (over 7 cu. yds., M.R.C.)

GROUP 9: Crane operator (over 25 tons and up to and including 50 tons mrc); Derrick barge operator (over 25 tons up to and including 50 tons mrc); Highline cableway operator; Hoist operator, stiff legs, Guy derrick or similar type (over 25 tons up to and including 50 tons mrc); K-crane operator; Polar crane operator; Self erecting tower crane operator maximum lifting capacity ten tons

GROUP 10: Crane operator (over 50 tons and up to and including 100 tons mrc); Derrick barge operator (over 50 tons up to and including 100 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 50 tons up to and including 100 tons mrc), Mobile tower crane operator (over 50 tons, up to and including 100 tons M.R.C.); Tower crane operator and tower gantry

GROUP 11: Crane operator (over 100 tons and up to and including 200 tons mrc); Derrick barge operator (over 100 tons up to and including 200 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 100 tons up to and including 200 tons mrc); Mobile tower crane operator (over 100 tons up to and including 200 tons mrc)

GROUP 12: Crane operator (over 200 tons up to and including 300 tons mrc); Derrick barge operator (over 200 tons up to and including 300 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 200 tons, up to and including 300 tons mrc); Mobile tower crane operator (over 200 tons, up to and including 300 tons mrc)

GROUP 13: Crane operator (over 300 tons); Derrick barge operator (over 300 tons); Helicopter pilot; Hoist operator, stiff legs, Guy derrick or similar type (over 300 tons); Mobile tower crane operator (over 300 tons)

TUNNEL CLASSIFICATIONS

GROUP 1: Skiploader (wheel type up to 3/4 yd. without attachment)

GROUP 2: Power-driven jumbo form setter operator

GROUP 3: Dinkey locomotive or motorperson (up to and including 10 tons)

GROUP 4: Bit sharpener; Equipment greaser (grease truck); Slip form pump operator (power-driven hydraulic lifting device for concrete forms); Tugger hoist operator (1 drum); Tunnel locomotive operator (over 10 and up to and including 30 tons)

GROUP 5: Backhoe operator (up to and including 3/4 yd.); Small Ford, Case or similar; Drill doctor; Grouting machine operator; Heading shield operator; Heavy-duty repairperson; Loader operator (Athey, Euclid, Sierra and similar types); Mucking machine operator (1/4 yd., rubber-tired, rail or track type); Pneumatic concrete placing machine operator (Hackley-Presswell or similar type); Pneumatic heading shield (tunnel); Pumpcrete gun operator; Tractor compressor drill combination operator; Tugger hoist operator (2 drum); Tunnel locomotive operator (over 30 tons)

GROUP 6: Heavy Duty Repairman

GROUP 7: Tunnel mole boring machine operator

ENGINEERS ZONES

\$1.00 additional per hour for all of IMPERIAL County and the portions of KERN, RIVERSIDE & SAN BERNARDINO Counties as defined below:

That area within the following Boundary: Begin in San Bernardino County, approximately 3 miles NE of the intersection of I-15 and the California State line at that point which is the NW corner of Section 1, T17N, R14E, San Bernardino Meridian. Continue W in a straight line to that point which is the SW corner of the northwest quarter of Section 6, T27S, R42E, Mt. Diablo Meridian. Continue North to the intersection with the Inyo County Boundary at that point which is the NE corner of the western half of the northern quarter of Section 6, T25S, R42E, MDM. Continue W along the Inyo and San Bernardino County boundary until the intersection with Kern County, as that point which is the SE corner of Section 34, T24S, R40E, MDM. Continue W along the Inyo and Kern County boundary until the intersection with Tulare County, at that point which is the SW corner of the SE quarter of Section 32, T24S, R37E, MDM. Continue W along the Kern and Tulare County boundary, until that point which is the NW corner of T25S, R32E, MDM. Continue S following R32E lines to the NW corner of T31S, R32E, MDM. Continue W to the NW corner of T31S, R31E,

MDM. Continue S to the SW corner of T32S, R31E, MDM. Continue W to SW corner of SE quarter of Section 34, T32S, R30E, MDM. Continue S to SW corner of T11N, R17W, SBM. Continue E along south boundary of T11N, SBM to SW corner of T11N, R7W, SBM. Continue S to SW corner of T9N, R7W, SBM. Continue E along south boundary of T9N, SBM to SW corner of T9N, R1E, SBM. Continue S along west boundary of R1E, SMB to Riverside County line at the SW corner of T1S, R1E, SBM. Continue E along south boundary of T1S, SBM (Riverside County Line) to SW corner of T1S, R10E, SBM. Continue S along west boundary of R10E, SBM to Imperial County line at the SW corner of T8S, R10E, SBM. Continue W along Imperial and Riverside county line to NW corner of T9S, R9E, SBM. Continue S along the boundary between Imperial and San Diego Counties, along the west edge of R9E, SBM to the south boundary of Imperial County/California state line. Follow the California state line west to Arizona state line, then north to Nevada state line, then continuing NW back to start at the point which is the NW corner of Section 1, T17N, R14E, SBM

\$1.00 additional per hour for portions of SAN LUIS OBISPO, KERN, SANTA BARBARA & VENTURA as defined below:

That area within the following Boundary: Begin approximately 5 miles north of the community of Cholame, on the Monterey County and San Luis Obispo County boundary at the NW corner of T25S, R16E, Mt. Diablo Meridian. Continue south along the west side of R16E to the SW corner of T30S, R16E, MDM. Continue E to SW corner of T30S, R17E, MDM. Continue S to SW corner of T31S, R17E, MDM. Continue E to SW corner of T31S, R18E, MDM. Continue S along West side of R18E, MDM as it crosses into San Bernardino Meridian numbering area and becomes R30W. Follow the west side of R30W, SBM to the SW corner of T9N, R30W, SBM. Continue E along the south edge of T9N, SBM to the Santa Barbara County and Ventura County boundary at that point which is the SW corner of Section 34. T9N, R24W, SBM, continue S along the Ventura County line to that point which is the SW corner of the SE quarter of Section 32, T7N, R24W, SBM. Continue E along the south edge of T7N, SBM to the SE corner to T7N, R21W, SBM. Continue N along East side of R21W, SBM to Ventura County and Kern County boundary at the NE corner of T8N, R21W. Continue W along the Ventura County and Kern County boundary to the SE corner of T9N, R21W. Continue North along the East edge of R21W, SBM to the NE corner of T12N, R21W, SBM. Continue West along the north edge of T12N, SBM to the SE corner of T32S, R21E, MDM. [T12N SBM is a thin strip between T11N SBM and T32S MDM]. Continue North along the East side of R21E, MDM to the Kings County and Kern County border at the NE corner of T25S, R21E, MDM, continue West along the Kings County and Kern County Boundary until the intersection of San Luis Obispo County. Continue west along the Kings County and San Luis Obispo County boundary until the intersection with Monterey County. Continue West along the Monterey County and San Luis Obispo County boundary to the beginning point at the NW corner of T25S, R16E, MDM.

\$2.00 additional per hour for INYO and MONO Counties and the Northern portion of SAN BERNARDINO County as defined below:

That area within the following Boundary: Begin at the intersection of the northern boundary of Mono County and the

California state line at the point which is the center of Section 17, T10N, R22E, Mt. Diablo Meridian. Continue S then SE along the entire western boundary of Mono County, until it reaches Inyo County at the point which is the NE corner of the Western half of the NW quarter of Section 2, T8S, R29E, MDM. Continue SSE along the entire western boundary of Inyo County, until the intersection with Kern County at the point which is the SW corner of the SE 1/4 of Section 32, T24S, R37E, MDM. Continue E along the Inyo and Kern County boundary until the intersection with San Bernardino County at that point which is the SE corner of section 34, T24S, R40E, MDM. Continue E along the Inyo and San Bernardino County boundary until the point which is the NE corner of the Western half of the NW quarter of Section 6, T25S, R42E, MDM. Continue S to that point which is the SW corner of the NW quarter of Section 6, T27S, R42E, MDM. Continue E in a straight line to the California and Nevada state border at the point which is the NW corner of Section 1, T17N, R14E, San Bernardino Meridian. Then continue NW along the state line to the starting point, which is the center of Section 18, T10N, R22E, MDM.

REMAINING AREA NOT DEFINED ABOVE RECIEVES BASE RATE

 ENGI0012-004 08/01/2014

	Rates	Fringes
OPERATOR: Power Equipment		
(DREDGING)		
(1) Leverman.....	\$ 48.60	22.40
(2) Dredge dozer.....	\$ 42.63	22.40
(3) Deckmate.....	\$ 42.52	22.40
(4) Winch operator (stern winch on dredge).....	\$ 41.97	22.40
(5) Fireman-Oiler, Deckhand, Bargeman, Leveehand.....	\$ 41.43	22.40
(6) Barge Mate.....	\$ 42.04	22.40

 * IRON0377-002 07/01/2014

	Rates	Fringes
Ironworkers:		
Fence Erector.....	\$ 26.58	17.74
Ornamental, Reinforcing and Structural.....	\$ 33.50	26.74

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

LABO0300-005 01/01/2014

	Rates	Fringes
Asbestos Removal Laborer.....	\$ 28.00	15.25

SCOPE OF WORK: Includes site mobilization, initial site cleanup, site preparation, removal of asbestos-containing material and toxic waste, encapsulation, enclosure and disposal of asbestos- containing materials and toxic waste by hand or with equipment or machinery; scaffolding, fabrication of temporary wooden barriers and assembly of decontamination stations.

LABO0345-001 07/01/2014

	Rates	Fringes
LABORER (GUNITE)		
GROUP 1.....	\$ 34.79	17.92
GROUP 2.....	\$ 33.84	17.92
GROUP 3.....	\$ 30.30	17.92

FOOTNOTE: GUNITE PREMIUM PAY: Workers working from a Bosn'n's Chair or suspended from a rope or cable shall receive 40 cents per hour above the foregoing applicable classification rates. Workers doing gunite and/or shotcrete work in a tunnel shall receive 35 cents per hour above the foregoing applicable classification rates, paid on a portal-to-portal basis. Any work performed on, in or above any smoke stack, silo, storage elevator or similar type of structure, when such structure is in excess of 75'-0" above base level and which work must be performed in whole or in part more than 75'-0" above base level, that work performed above the 75'-0" level shall be compensated for at 35 cents per hour above the applicable classification wage rate.

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Rodmen, Nozzlemen

GROUP 2: Gunmen

GROUP 3: Reboundmen

LABO1184-001 07/01/2014

	Rates	Fringes
Laborers: (HORIZONTAL DIRECTIONAL DRILLING)		
(1) Drilling Crew Laborer...	\$ 31.65	13.33
(2) Vehicle Operator/Hauler.	\$ 31.82	13.33
(3) Horizontal Directional Drill Operator.....	\$ 33.67	13.33
(4) Electronic Tracking Locator.....	\$ 35.67	13.33
Laborers: (STRIPING/SLURRY SEAL)		
GROUP 1.....	\$ 32.56	16.28

GROUP 2.....	\$ 33.86	16.28
GROUP 3.....	\$ 35.87	16.28
GROUP 4.....	\$ 37.61	16.28

LABORERS - STRIPING CLASSIFICATIONS

GROUP 1: Protective coating, pavement sealing, including repair and filling of cracks by any method on any surface in parking lots, game courts and playgrounds; carstops; operation of all related machinery and equipment; equipment repair technician

GROUP 2: Traffic surface abrasive blaster; pot tender - removal of all traffic lines and markings by any method (sandblasting, waterblasting, grinding, etc.) and preparation of surface for coatings. Traffic control person: controlling and directing traffic through both conventional and moving lane closures; operation of all related machinery and equipment

GROUP 3: Traffic delineating device applicator: Layout and application of pavement markers, delineating signs, rumble and traffic bars, adhesives, guide markers, other traffic delineating devices including traffic control. This category includes all traffic related surface preparation (sandblasting, waterblasting, grinding) as part of the application process. Traffic protective delineating system installer: removes, relocates, installs, permanently affixed roadside and parking delineation barricades, fencing, cable anchor, guard rail, reference signs, monument markers; operation of all related machinery and equipment; power broom sweeper

GROUP 4: Striper: layout and application of traffic stripes and markings; hot thermo plastic; tape traffic stripes and markings, including traffic control; operation of all related machinery and equipment

LABO1184-002 07/01/2014

	Rates	Fringes
LABORER (TUNNEL)		
GROUP 1.....	\$ 35.74	16.48
GROUP 2.....	\$ 36.06	16.48
GROUP 3.....	\$ 36.52	16.48
GROUP 4.....	\$ 37.21	16.48
LABORER		
GROUP 1.....	\$ 30.19	16.48
GROUP 2.....	\$ 30.74	16.48
GROUP 3.....	\$ 31.29	16.48
GROUP 4.....	\$ 32.84	16.48
GROUP 5.....	\$ 33.19	16.48

LABORER CLASSIFICATIONS

GROUP 1: Cleaning and handling of panel forms; Concrete screeding for rough strike-off; Concrete, water curing; Demolition laborer, the cleaning of brick if performed by a worker performing any other phase of demolition work, and the cleaning of lumber; Fire watcher, limber, brush loader, piler and debris handler; Flag person; Gas, oil and/or water pipeline laborer; Laborer, asphalt-rubber material

loader; Laborer, general or construction; Laborer, general clean-up; Laborer, landscaping; Laborer, jetting; Laborer, temporary water and air lines; Material hose operator (walls, slabs, floors and decks); Plugging, filling of shee bolt holes; Dry packing of concrete; Railroad maintenance, repair track person and road beds; Streetcar and railroad construction track laborers; Rigging and signaling; Scaler; Slip form raiser; Tar and mortar; Tool crib or tool house laborer; Traffic control by any method; Window cleaner; Wire mesh pulling - all concrete pouring operations

GROUP 2: Asphalt shoveler; Cement dumper (on 1 yd. or larger mixer and handling bulk cement); Cesspool digger and installer; Chucktender; Chute handler, pouring concrete, the handling of the chute from readymix trucks, such as walls, slabs, decks, floors, foundation, footings, curbs, gutters and sidewalks; Concrete curer, impervious membrane and form oiler; Cutting torch operator (demolition); Fine grader, highways and street paving, airport, runways and similar type heavy construction; Gas, oil and/or water pipeline wrapper - pot tender and form person; Guinea chaser; Headerboard person - asphalt; Laborer, packing rod steel and pans; Membrane vapor barrier installer; Power broom sweeper (small); Riprap stonepaver, placing stone or wet sacked concrete; Roto scraper and tiller; Sandblaster (pot tender); Septic tank digger and installer(lead); Tank scaler and cleaner; Tree climber, faller, chain saw operator, Pittsburgh chipper and similar type brush shredder; Underground laborer, including caisson bellower

GROUP 3: Buggymobile person; Concrete cutting torch; Concrete pile cutter; Driller, jackhammer, 2-1/2 ft. drill steel or longer; Dri-pak-it machine; Gas, oil and/or water pipeline wrapper, 6-in. pipe and over, by any method, inside and out; High scaler (including drilling of same); Hydro seeder and similar type; Impact wrench multi-plate; Kettle person, pot person and workers applying asphalt, lay-kold, creosote, lime caustic and similar type materials ("applying" means applying, dipping, brushing or handling of such materials for pipe wrapping and waterproofing); Operator of pneumatic, gas, electric tools, vibrating machine, pavement breaker, air blasting, come-alongs, and similar mechanical tools not separately classified herein; Pipelayer's backup person, coating, grouting, making of joints, sealing, caulking, diapering and including rubber gasket joints, pointing and any and all other services; Rock slinger; Rotary scarifier or multiple head concrete chipping scarifier; Steel headerboard and guideline setter; Tamper, Barko, Wacker and similar type; Trenching machine, hand-propelled

GROUP 4: Asphalt raker, lute person, ironer, asphalt dump person, and asphalt spreader boxes (all types); Concrete core cutter (walls, floors or ceilings), grinder or sander; Concrete saw person, cutting walls or flat work, scoring old or new concrete; Cribber, shorer, lagging, sheeting and trench bracing, hand-guided lagging hammer; Head rock slinger; Laborer, asphalt- rubber distributor boot person; Laser beam in connection with laborers' work; Oversize concrete vibrator operator, 70 lbs. and over; Pipelayer performing all services in the laying and installation of

pipe from the point of receiving pipe in the ditch until completion of operation, including any and all forms of tubular material, whether pipe, metallic or non-metallic, conduit and any other stationary type of tubular device used for the conveying of any substance or element, whether water, sewage, solid gas, air, or other product whatsoever and without regard to the nature of material from which the tubular material is fabricated; No-joint pipe and stripping of same; Prefabricated manhole installer; Sandblaster (nozzle person), water blasting, Porta Shot-Blast

GROUP 5: Blaster powder, all work of loading holes, placing and blasting of all powder and explosives of whatever type, regardless of method used for such loading and placing; Driller: All power drills, excluding jackhammer, whether core, diamond, wagon, track, multiple unit, and any and all other types of mechanical drills without regard to the form of motive power; Toxic waste removal

TUNNEL LABORER CLASSIFICATIONS

GROUP 1: Batch plant laborer; Changehouse person; Dump person; Dump person (outside); Swamper (brake person and switch person on tunnel work); Tunnel materials handling person; Nipper; Pot tender, using mastic or other materials (for example, but not by way of limitation, shotcrete, etc.)

GROUP 2: Chucktender, cabletender; Loading and unloading agitator cars; Vibrator person, jack hammer, pneumatic tools (except driller); Bull gang mucker, track person; Concrete crew, including rodder and spreader

GROUP 3: Blaster, driller, powder person; Chemical grout jet person; Cherry picker person; Grout gun person; Grout mixer person; Grout pump person; Jackleg miner; Jumbo person; Kemper and other pneumatic concrete placer operator; Miner, tunnel (hand or machine); Nozzle person; Operating of troweling and/or grouting machines; Powder person (primer house); Primer person; Sandblaster; Shotcrete person; Steel form raiser and setter; Timber person, retimber person, wood or steel; Tunnel Concrete finisher

GROUP 4: Diamond driller; Sandblaster; Shaft and raise work

LABO1184-004 07/01/2014		
	Rates	Fringes
Brick Tender.....	\$ 29.12	15.78

LABO1414-001 08/07/2013		
	Rates	Fringes
LABORER		
PLASTER CLEAN-UP LABORER....	\$ 27.45	16.36
PLASTER TENDER.....	\$ 30.00	16.36

Work on a swing stage scaffold: \$1.00 per hour additional.

PAIN0036-001 07/01/2014		
	Rates	Fringes
Painters: (Including Lead Abatement)		
(1) Repaint (excludes San		

Diego County).....	\$ 26.89	12.28
(2) All Other Work.....	\$ 30.27	12.28

REPAINT of any previously painted structure. Exceptions: work involving the aerospace industry, breweries, commercial recreational facilities, hotels which operate commercial establishments as part of hotel service, and sports facilities.

PAIN0036-008 01/01/2014		
	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 34.03	15.41

PAIN0036-015 06/01/2014		
	Rates	Fringes
GLAZIER.....	\$ 37.95	22.69

FOOTNOTE: Additional \$1.25 per hour for work in a condor, from the third (3rd) floor and up Additional \$1.25 per hour for work on the outside of the building from a swing stage or any suspended contrivance, from the ground up

PAIN1247-002 01/01/2014		
	Rates	Fringes
SOFT FLOOR LAYER.....	\$ 29.85	12.56

* PLAS0200-009 08/06/2014		
	Rates	Fringes
PLASTERER.....	\$ 37.43	13.28

PLAS0500-002 07/07/2014		
	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER....	\$ 31.85	19.55

PLUM0016-001 07/01/2014		
	Rates	Fringes

PLUMBER/PIPEFITTER

Plumber and Pipefitter All other work except work on new additions and remodeling of bars, restaurant, stores and commercial buildings not to exceed 5,000 sq. ft. of floor space and work on strip malls, light commercial, tenant improvement and remodel work.....	\$ 44.71	20.36
Work ONLY on new additions and remodeling of bars, restaurant, stores and commercial buildings not to exceed 5,000 sq. ft. of floor space.....	\$ 43.33	19.38

Work ONLY on strip malls,
 light commercial, tenant
 improvement and remodel
 work.....\$ 34.59 17.71

 PLUM0345-001 07/01/2014

	Rates	Fringes
PLUMBER		
Landscape/Irrigation Fitter..\$ 29.27		19.75
Sewer & Storm Drain Work....\$ 33.24		17.13

 ROOF0036-002 08/01/2014

	Rates	Fringes
ROOFER.....\$ 35.02		13.57

FOOTNOTE: Pitch premium: Work on which employees are exposed to pitch fumes or required to handle pitch, pitch base or pitch impregnated products, or any material containing coal tar pitch, the entire roofing crew shall receive \$1.75 per hour "pitch premium" pay.

 SFCA0669-002 07/01/2013

	Rates	Fringes
SPRINKLER FITTER.....\$ 34.10		19.38

 SHEE0105-003 07/01/2014

LOS ANGELES (South of a straight line drawn between Gorman and Big Pines)and Catalina Island, INYO, KERN (Northeast part, East of Hwy 395), MONO ORANGE, RIVERSIDE, AND SAN BERNARDINO COUNTIES

	Rates	Fringes
SHEET METAL WORKER		
(1) Commercial - New Construction and Remodel work.....\$ 40.79		23.75
(2) Industrial work including air pollution control systems, noise abatement, hand rails, guard rails, excluding aritechtrual sheet metal work, excluding A-C, heating, ventilating systems for human comfort...\$ 40.79		23.75

 TEAM0011-002 07/01/2013

	Rates	Fringes
TRUCK DRIVER		
GROUP 1.....\$ 27.59		22.69
GROUP 2.....\$ 27.74		22.69
GROUP 3.....\$ 27.87		22.69
GROUP 4.....\$ 28.06		22.69
GROUP 5.....\$ 28.09		22.69
GROUP 6.....\$ 28.12		22.69

GROUP 7.....	\$ 28.37	22.69
GROUP 8.....	\$ 28.62	22.69
GROUP 9.....	\$ 28.82	22.69
GROUP 10.....	\$ 29.12	22.69
GROUP 11.....	\$ 29.62	22.69
GROUP 12.....	\$ 30.05	22.69

WORK ON ALL MILITARY BASES:

PREMIUM PAY: \$3.00 per hour additional.

[29 palms Marine Base, Camp Roberts, China Lake, Edwards AFB, El Centro Naval Facility, Fort Irwin, Marine Corps Logistics Base at Nebo & Yermo, Mountain Warfare Training Center, Bridgeport, Point Arguello, Point Conception, Vandenberg AFB]

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Truck driver

GROUP 2: Driver of vehicle or combination of vehicles - 2 axles; Traffic control pilot car excluding moving heavy equipment permit load; Truck mounted broom

GROUP 3: Driver of vehicle or combination of vehicles - 3 axles; Boot person; Cement mason distribution truck; Fuel truck driver; Water truck - 2 axle; Dump truck, less than 16 yds. water level; Erosion control driver

GROUP 4: Driver of transit mix truck, under 3 yds.; Dumpcrete truck, less than 6-1/2 yds. water level

GROUP 5: Water truck, 3 or more axles; Truck greaser and tire person (\$0.50 additional for tire person); Pipeline and utility working truck driver, including winch truck and plastic fusion, limited to pipeline and utility work; Slurry truck driver

GROUP 6: Transit mix truck, 3 yds. or more; Dumpcrete truck, 6-1/2 yds. water level and over; Vehicle or combination of vehicles - 4 or more axles; Oil spreader truck; Dump truck, 16 yds. to 25 yds. water level

GROUP 7: A Frame, Swedish crane or similar; Forklift driver; Ross carrier driver

GROUP 8: Dump truck, 25 yds. to 49 yds. water level; Truck repair person; Water pull - single engine; Welder

GROUP 9: Truck repair person/welder; Low bed driver, 9 axles or over

GROUP 10: Dump truck - 50 yds. or more water level; Water pull - single engine with attachment

GROUP 11: Water pull - twin engine; Water pull - twin engine with attachments; Winch truck driver - \$1.25 additional when operating winch or similar special attachments

GROUP 12: Boom Truck 17K and above

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

=====
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 union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with
characters other than "SU" denotes that the union
classification and rate have found to be prevailing for that
classification. Example: PLUM0198-005 07/01/2011. The first
four letters , PLUM, indicate the international union and the
four-digit number, 0198, that follows 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.
The date, 07/01/2011, following these characters is the
effective date of the most current negotiated rate/collective
bargaining agreement which would be July 1, 2011 in the above
example.

Union prevailing wage rates will be updated to reflect any
changes in the collective bargaining agreements governing the
rates.

0000/9999: weighted union wage rates will be published annually
each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived
from survey data by computing average rates and are not union
rates; however, the data used in computing these rates may
include both union and non-union data. Example: SULA2004-007
5/13/2010. SU indicates the rates are not union majority rates,
LA indicates the State of Louisiana; 2004 is the year of the
survey; and 007 is an internal number used in producing the
wage determination. A 1993 or later date, 5/13/2010, indicates
the classifications and rates under that identifier were issued
as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change

until a new survey is conducted.

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.

END OF GENERAL DECISION

Appendix E

Additional Federal Requirements Exhibits

Additional Federal Requirements Exhibits

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- 6. Caltrans LAPM, Exhibit 17-O**
Disadvantaged Business Enterprises (DBE) Certification Status
Pages 24 through 25 of 25

Caltrans LAPM, Exhibit 12-E, Attachment A

FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in the General Conditions.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VI, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VI of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 26, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____

2. Address of joint venture _____

3. Phone number of joint venture _____

4. Identify the firms, which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

 - a. Describe the role of the MBE firm in the joint venture.

 - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

5. Nature of the joint venture's business _____

6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? _____

8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).

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- a. Profit and loss sharing.
- b. Capital contributions, including equipment.
- c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision-making, including, but not limited to, those with prime responsibility for:

a. Financial decisions _____

b. Management decisions, such as:

1. Estimating _____

2. Marketing and sales _____

3. Hiring and firing of management personnel _____

4. Purchasing of major items or supplies _____

c. Supervision of field operations _____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefore and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

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..... Name of Firm Name of Firm
..... Signature Signature
..... Name Name
..... Title Title
..... Date Date

Date _____
State of _____
County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____
Commission expires _____

[Seal]
Date _____
State of _____
County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____
Commission expires _____

[Seal]

**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

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.

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 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.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable 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 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 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).

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.

Female and Minority Goals

To comply with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-Aid Construction Contracts," the following female and minority utilization goals for Federal-aid construction contracts and subcontracts that exceed \$10,000.

The nationwide goal for female utilization is 6.9 percent.

The goals for minority utilization [45 Fed Reg 65984 (10/3/1980)] are as follows:

Minority Utilization Goals

Economic Area		Goal (Percent)
174	Redding CA: Non-SMSA Counties: CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehema	6.8
175	Eureka, CA Non-SMSA Counties: CA Del Norte; CA Humboldt; CA Trinity	6.6
176	San Francisco-Oakland-San Jose, CA: SMSA Counties: 7120 Salinas-Seaside-Monterey, CA CA Monterey	28.9
	7360 San Francisco-Oakland CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo	25.6
	7400 San Jose, CA CA Santa Clara, CA	19.6
	7485 Santa Cruz, CA CA Santa Cruz	14.9
	7500 Santa Rosa CA Sonoma	9.1
	8720 Vallejo-Fairfield-Napa, CA CA Napa; CA Solano	17.1
	Non-SMSA Counties: CA Lake; CA Mendocino; CA San Benito	23.2
177	Sacramento, CA: SMSA Counties: 6920 Sacramento, CA CA Placer; CA Sacramento; CA Yolo	16.1
	Non-SMSA Counties CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba	14.3
178	Stockton-Modesto, CA: SMSA Counties: 5170 Modesto, CA CA Stanislaus	12.3
	8120 Stockton, CA CA San Joaquin	24.3
	Non-SMSA Counties CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Toulumne	19.8
179	Fresno-Bakersfield, CA SMSA Counties: 0680 Bakersfield, CA CA Kern	19.1
	2840 Fresno, CA CA Fresno	26.1
	Non-SMSA Counties:	23.6

1. In any classification in which the employee has successfully completed a training course leading to journeyman status or in which the employee has been employed as a journeyman
2. Who is not registered in a program approved by the US Department of Labor, Bureau of Apprenticeship and Training

Ask the employee if the employee has successfully completed a training course leading to journeyman status or has been employed as a journeyman. Your records must show the employee's answers to the questions.

In your training program, establish the minimum length and training type for each classification. The City/County of _____ and FHWA approves a program if one of the following is met:

1. It is calculated to:
 - 1.1. Meet the your equal employment opportunity responsibilities
 - 1.2. Qualify the average apprentice or trainee for journeyman status in the classification involved by the end of the training period
2. It is registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training and it is administered in a way consistent with the equal employment responsibilities of federal-aid highway construction contracts

Obtain the State's approval for your training program before you start work involving the classification covered by the program.

Provide training in the construction crafts, not in clerk-typist or secretarial-type positions. Training is allowed in lower level management positions such as office engineers, estimators, and timekeepers if the training is oriented toward construction applications. Training is allowed in the laborer classification if significant and meaningful training is provided and approved by the division office. Off-site training is allowed if the training is an integral part of an approved training program and does not make up a significant part of the overall training.

The City/County of _____ reimburses you 80 cents per hour of training given an employee on this contract under an approved training program:

1. For on-site training
2. For off-site training if the apprentice or trainee is currently employed on a federal-aid project and you do at least one of the following:
 - 2.1. Contribute to the cost of the training
 - 2.2. Provide the instruction to the apprentice or trainee
 - 2.3. Pay the apprentice's or trainee's wages during the off-site training period
3. If you comply with this section.

Each apprentice or trainee must:

1. Begin training on the project as soon as feasible after the start of work involving the apprentice's or trainee's skill
2. Remain on the project as long as training opportunities exist in the apprentice's or trainee's work classification or until the apprentice or trainee has completed the training program

Furnish the apprentice or trainee:

1. Copy of the program you will comply with in providing the training
2. Certification showing the type and length of training satisfactorily completed

Maintain records and submit reports documenting your performance under this section.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
SUBCONTRACTING REQUEST
DC-CEM-1201 (REV. 4/94) (OLD HC-45) CT# 7541-3514-7

FRONT

See Instructions
On Back

		REQUEST NUMBER
CONTRACTOR NAME		COUNTY
BUSINESS ADDRESS		ROUTE
CITY/STATE		CONTRACT NO.
ZIP CODE		FEDERAL AID PROJECT NO. (From Special Provisions)

SUBCONTRACTOR (Name, Business Address, Phone)	BID ITEM NUMBER(S)	% OF BID ITEM SUBBED	CHECK IF: (See Categories Below)			DESCRIBE WORK WHEN LESS THAN 100% OF WORK IS SUBBED	\$ AMOUNT BASED ON BID \$ AMOUNT
			(1)	(2)	(3)		

Categories: 1) Specialty 2) Listed Under Fair Practices Act 3) Certified DBE/MBE/WBE/DVBE

I Certify That:

- The Standard Provisions for labor set forth in the contract apply to the subcontracted work.
- If applicable, (Federal Aid Projects only) Section 14 (Federal Requirements) of the Special Provisions have been inserted in the subcontracts and shall be incorporated in any lower-tier subcontract. Written contracts have been executed for the above noted subcontracted work.

CONTRACTOR'S SIGNATURE	DATE
------------------------	------

NOTE: This section is to be completed by the Resident Engineer

1. Total of bid items	\$	
2. Specialty items (previously requested)	\$	
3. Specialty items (this request)	\$	
4. Total (lines 2+3)	\$	
5. Contractor must perform with own forces (lines 1 minus 4) x	%	
6. Bid items previously subcontracted	\$	
7. Bid items subcontracted (this request)	\$	
8. Total (lines 6+7)	\$	
9. Balance of work Contractor to perform (lines 1 minus 8).....	\$	

APPROVED	
RESIDENT ENGINEER'S SIGNATURE	DATE

CEM-1201 (HC-46 REV. 4/94) COPY DISTRIBUTION: 1. Original - Contractor 2. Copy - local agency Resident Engineer
3. Copy - local agency Labor Compliance Officer 4. Contractor's Information Copy

Back

INSTRUCTIONS FOR COMPLETING SUBCONTRACTING REQUEST FORM

All First-tier subcontractors must be included on a subcontracting request.

Submit in accordance with Section 8-1.01 of the Standard Specifications. Type or print requested information. Information copy is to be retained by the contractor. Submit other copies to project's Resident Engineer. After approval, the original will be returned to the contractor.

When an entire item is subcontracted, the value to be shown is the contractor's bid price.

When a portion of an item is subcontracted, describe the portion, and show the % of bid item and value.

THIS FORM IS NOT TO BE USED FOR SUBSTITUTIONS.

Prior to submittal of a DC-CEM-1201 involving a replacement Subcontractor, submit a separate written request for approval to substitute a listed subcontractor. Section 4107 of the Government Code covers the conditions for substitution.

Submit a separate written request for approval of any DBE/MBE/WBE/DVBE substitution. Include appropriate backup information and state what efforts were made to accomplish the same dollar value of work by other certified DBE/MBE/WBE/DVBEs.

NOTE: For contractors who will be performing work on railroad property, it is necessary for the contractor to complete and submit the Certificate of Insurance (State Form DH-OS-A10A) naming the subcontractor as insured. *No work shall be allowed which involves encroachment on railroad property until the specified insurance has been approved.*

MONTHLY DBE TRUCKING VERIFICATION

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
MONTHLY DBE TRUCKING VERIFICATION
CP-CEM-2404(F) (NEW 12/99)

CONTRACT NO.

Truck Owner	DBE Cert. No.	Company Name and Address	Truck No.	California Hwy. Patrol CA No.	Commission Or Amount Paid*	Date Paid	Lease Arrangement (if applicable)	YEAR
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
					\$		Lease Agreement with Non-DBE with DBE	
TOTAL AMOUNT PAID					\$			

PRIME CONTRACTOR

BUSINESS ADDRESS

BUSINESS PHONE NO.

* Upon request all Lease Agreements shall be made available, in accordance with the Special Provisions.

I CERTIFY THAT THE ABOVE INFORMATION IS COMPLETE AND CORRECT

CONTRACTOR REPRESENTATIVE'S SIGNATURE

TITLE

DATE

CEM-2404F (NEW 12/99)

COPY DISTRIBUTION: ORIGINAL - RESIDENT ENGINEER

Form CP-CEM 2404 (F)(NEW 12/99)
MONTHLY DBE TRUCKING VERIFICATION

The top of Form CEM-2404(F) contains boxes to put in the Contract Number, the Month of the reporting period and the Year of the reporting period.

The Form CEM-2404(F) has a column to enter the name of the Truck Owner, the DBE Cert. No. (if DBE certified) and the Name and Address of the trucking company. The Form CEM-2404(F) also requires the Truck No. and the California Highway Patrol CA No.

Form CEM-2404(F) is to be submitted prior to the 15th of each month and must show the dollar amount paid to the DBE trucking company(s) for trucking work performed by DBE certified trucks and for any fees or commissions of nonDBE trucks utilized each month on the project. The amount paid to each trucking company is to be entered in the column called "Commission or Amount Paid," in accordance with the Special Provisions Section 5-1.X.

Payment information is derived using the following:

- 1.) 100% for the trucking services provided by the DBE using trucks it owns, operates and insures.
- 2.) 100% for the trucking services provided by the trucks leased from other DBE firms.
- 3.) The fee or commission paid to nonDBEs for the lease of trucks. The Prime does not receive 100% credit for these services because they are not provided by a DBE company.

The total dollar figure of this column is to be placed in the box labeled "Total Amount Paid." The column "Date Paid" requires a date that each trucking company is paid for services rendered. The next column contains information that must be completed if a lease arrangement is applicable. Located at the bottom of the form is a space to put the name of the "Prime Contractor," their "Business Address" and their "Business Phone No."

At the bottom of the form there is a space for the Contractor or designee "Contractor Representative's Signature, Title and Date" certifying that the information provided on the form is complete and correct.

FINAL REPORT – UTILIZATION OF DISADVANTAGED BUSINESS ENTERPRISES (DBE), FIRST-TIER SUBCONTRACTORS
 CEM 2402(F) (Rev. 02/2008)

The form requires specific information regarding the construction project: Contract Number, County, Route, Post Miles, Federal-aid Project No., the Administering Agency, the Contract Completion Date and the Estimated Contract Amount. It requires the prime contractor name and business address. The focus of the form is to describe who did what by contract item number and descriptions, asking for specific dollar values of item work completed broken down by subcontractors who performed the work both DBE and non-DBE work forces. DBE prime contractors are required to show the date of work performed by their own forces along with the corresponding dollar value of work.

The form has a column to enter the Contract Item No. (or Item No's) and description of work performed or materials provided, as well as a column for the subcontractor name and business address. For those firms who are DBE, there is a column to enter their DBE Certification Number. The DBE should provide their certification number to the contractor and notify the contractor in writing with the date of the decertification if their status should change during the course of the project.

The form has six columns for the dollar value to be entered for the item work performed by the subcontractor.

The Non-DBE column is used to enter the dollar value of work performed for firms who are not certified DBE.

The decision of which column to be used for entering the DBE dollar value is based on what program(s) status the firm is certified. This program status is determined by the California Unified Certification Program by ethnicity, gender, ownership, and control issues at time of certification. To confirm the certification status and program status, access the Department of Transportation Civil Rights web site at: <http://www.dot.ca.gov/hq/bep> or by calling (916) 324-1700 or the toll free number at (888) 810-6346.

Based on this DBE Program status, the following table depicts which column to be used:

DBE Program Status	Column to be used
If program status shows DBE only with no other programs listed	DBE

If a contractor performing work as a DBE on the project becomes decertified and still performs work after their decertification date, enter the total dollar value performed by this contractor under the appropriate DBE identification column.

If a contractor performing work as a non-DBE on the project becomes certified as a DBE, enter the dollar value of all work performed after certification as a DBE under the appropriate identification column.

Enter the total of each of the six columns in Form CEM-2402(F).

Any changes to DBE certification must also be submitted on Form-CEM 2403(F).

Enter the Date Work Completed as well as the Date of Final Payment (the date when the prime contractor made the "final payment" to the subcontractor for the portion of work listed as being completed).

The contractor and the resident engineer sign and date the form indicating that the information provided is complete and correct.

Form CP-CEM 2403(F) (New 10/99)
DISADVANTAGED BUSINESS ENTERPRISES (DBE) CHANGE IN CERTIFICATION STATUS REPORT

The top of the form requires specific information regarding the construction project: Contract Number, County, Route, Post Miles, the Administering Agency, the Contract Completion Date, and the Estimated Contract Amount. It requires the Prime Contractor's name and Business Address. The focus of the form is to substantiate and verify the actual DBE dollar amount paid to contractors on federally funded projects that had a changed in Certification status during the course of the completion of the contract. The two situations that are being addressed by CP-CEM 2403(F) are, if a firm certified as a DBE and doing work on the contract during the course of the project becomes Decertified, and if a non-DBE firm doing work on the contract during the course of the project becomes Certified as a DBE.

The form has a column to enter the Contract Item No (or Item Nos.) as well as a column for the Subcontractor's Name, Business Address, Business Phone, and contractor's Certification Number.

The column entitled Amount Paid While Certified will be used to enter the actual dollar value of the work performed by those contractors who meet the conditions as outlined above during the time period they are Certified as a DBE. This column on the CP-CEM-2403(F) should only reflect the dollar value of work performed while the firm was Certified as a DBE.

The column called Certification/Decertification Date (Letter attached) will reflect either the date of the Decertification Letter sent out by the Civil Rights Program or the date of the Certification Certificate mailed out by the Civil Rights Program. There is a box to check that support documentation is attached to the CP-CEM-2403 (F) form.

There is a Comments section for any additional information that may need to be provided regarding any of the above transactions.

The CEM-2403(F) has an area at the bottom where the Contractor and the Resident Engineer sign and date that the information provided is complete and correct.

There is a Comments section for any additional information that may need to be provided regarding any of the above transactions.

The CEM-2403(F) has an area at the bottom where the Contractor and the Resident Engineer sign and date that the information provided is complete and correct.

Appendix F

CALTRANS Encroachment Permit

ENCROACHMENT PERMIT

TR-0120 (REV. 6/2012)

In compliance with:

- Your application of August 26, 2014
- Utility Notice No. _____ of _____
- Agreement No. 08-1574 of July 16, 2014
- R/W Contract No. _____ of _____

Permit No. 08-14-A-OP-0729	
Dist/Co/Rte/PM 08-RIV-215 PM R17.8-PM R19.2	
Date 09/03/2014	
Fee Paid \$ EA 0J440	Deposit \$ EA 0J440
Performance Bond Amount (1) \$ 0.00	Payment Bond Amount (2) \$ 0.00
Bond Company	
Bond Number (1)	Bond Number (2)

TO: County of Riverside Transportation Department
 3525 14th Street
 Riverside, CA 92501
 Attn: Cindi Wachi 951-955-1863

, PERMITTEE

and subject to the following, PERMISSION IS HEREBY GRANTED to:

Enter onto Interstate 215 right-of-way at Newport Road Interchange in Menifee, within Riverside County, to construct interchange and roadway improvements, as per plan date stamped August 15, 2014 by California Department of Transportation Encroachment Permit Office and/or as directed by Caltrans Representative.

Notwithstanding General Provision #4, your contractor is required to apply for and obtain an encroachment permit, at no cost, prior to starting work. An approved Storm Water Pollution Prevention Plan (SWPPP) is required at the time of application.

A pre-job meeting with the assigned Caltrans Representatives, Chad Yang, (951) 232-3513, and Shivinderjit Singh, (951)830-6051 is required at least 7 days prior to start of any work under this permit.

THIS PERMIT IS NOT A PROPERTY RIGHT AND DOES NOT TRANSFER WITH THE PROPERTY TO A NEW OWNER.

The following attachments are also included as part of this permit (Check applicable):

- Yes No General Provisions
- Yes No Utility Maintenance Provisions
- Yes No Storm Water Special Provisions
- Yes No Special Provisions
- Yes No A Cal-OSHA permit, if required: Permit No. _____
- Yes No As-Built Plans Submittal Route Slip for Locally Advertised Projects
- Yes No Storm Water Pollution Prevention Plan / Water Pollution Control Plan

In addition to fee, the permittee will be billed actual costs for:

- Yes No Review
- Yes No Inspection
- Yes No Field Work

(if any Caltrans effort expended)

- Yes No The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before September 3, 2015

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.

No project work shall be commenced until all the other necessary permits and the environmental clearances have been obtained.

PERMIT ENGINEER: Reza Moslemi
 COPIES TO:
 Maint:Riverside 720: 1
 Landscaping Bill Moro:1
 Structures:Arvind Patel,1
 Const:Chad Yang, 1
 Const Elec:Shivinderjit Singh,1
 Construction Landscape,1
 File : 14-0729, 1
 PM: Emad Makar, 1
 CT Lab (3)
 Oversight Design:2
 HQ Structures Design:3

APPROVED:

 Basem Muallem, District Director

BY:


 RICHARD GOH, P.E. District Permit Engineer

PAGE 2: ATTACHED TO AND MADE PART OF PERMIT NO. 08-14-A-OP-0729

- Except for installing, maintaining and removing traffic control devices, any work encroaching within 3 feet of the edge of a travel lane for areas with a posted speed limit below 45mph, or 6 feet of the edge of a travel lane, for areas with a speed limit posted at 45mph or higher, shall require closing of that travel lane. Any work encroaching within 6 feet of the edge of the shoulder, shall require closing of that shoulder. Permittee shall notify the Department's Representative, and obtain approval of, all traffic control, lane closures or detours, at least seven (7) WORKING DAYS prior to setting up of any traffic control.
- Traffic control is generally authorized between 9:00 AM and 3:00 PM only on Monday through Thursday and until 1:00 PM on Fridays, excluding holidays except specified in the Permit. Lane closure is not allowed on Saturdays, Sundays and designated holidays. The designated holidays are: January 1st, the third Monday in January, the second and third Mondays in February, March 31, the last Monday in May, July 4th, the first Monday in September, the second Monday in October, November 11th, Thanksgiving Day, the day after Thanksgiving Day, and December 25th. When a fixed holiday falls on Saturday, the preceding Friday shall be designated as holiday.
- Should any deviation from these procedures or conditions be observed, all work shall be suspended until satisfactory steps have been taken to ensure compliance.
- If time extension is necessary, a request for time extension and the accompanying attachments must be made a minimum of two (2) weeks prior to completion date stated on face of permit. If work has not been started before completion date, the permit will be voided. Failure to comply with rules and regulations stated on permit will jeopardize future permit privileges.
- "AS-BUILT" PLANS ARE REQUIRED UPON COMPLETION OF ALL WORK. PLEASE REFER TO THE GENERAL PROVISION TR-0045, ITEM 22 FOR THE "AS-BUILT" REQUIREMENTS. NO FINAL INSPECTION WILL BE PERFORMED UNTIL THE DEPARTMENT IS IN RECEIPT OF "AS-BUILT" PLANS.
- No vehicle or equipment shall be stored overnight within the right of way; it shall be removed immediately at the completion of the day's work. Refueling of vehicle or equipment within the right of way is strictly prohibited.
- Required traffic control devices shall be installed around fixed objects to warn the motoring public for safety. Personal vehicles of the contractor shall not be parked within freeway right of way.
- No materials or waste shall be stockpiled within State right of way.
- Except as specifically provided herein, all requirements of the Vehicle Code and other applicable laws must be complied with in all particulars.
- When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane. The permittee shall not reduce the width of the existing lane to less than 10 feet without written approval from the Department's Representative.
- Excavations made within the limits of the right of way shall be backfilled and resurfaced to original condition before leaving the work area unless otherwise authorized by the Department's Representative.
- Permittee shall be responsible for arranging the services of a qualified traffic control contractor to provide any needed traffic control.

PAGE 3: ATTACHED TO AND MADE PART OF PERMIT NO. 08-14-A-OP-0729

The permittee shall arrange a meeting between his field representative, traffic control contractor, Department's Representative and/or CHP at least two (2) weeks prior to start of any work covered under this permit to arrange date and time of starting work and determine appropriate methods of handling traffic. At least 3 working days notice shall be given to the Caltrans representative and/or the CHP, prior to the meeting to allow time to arrange for attendance.

A copy of this permit, complete with all attachments, shall be kept by permittee/contractor working under this permit and must be shown to the Department Permit Inspector, Department's Representatives, or Law Enforcement Officer, on demand.

The permittee shall be responsible for notifying the appropriate utility companies or underground service alert prior to any excavation work.

The permittee shall notify the California Highway Patrol Area Commander at least 72 hours prior to implementing traffic control.

When the work area encroaches upon a sidewalk, walkway, or crosswalk area, special consideration must be given to pedestrian safety. Protective barricades, fencing, handrails and bridges, together with warning and guidance devices and signs must be utilized so that the passageway for pedestrians, especially blind and other physically handicapped, is safe and well defined and shown on the approved permit plan.

Pedestrian walkways and canopies within State Right of Way shall comply with the requirements of the applicable local agency or of the latest edition of the Uniform Building Code whichever contains the higher standards.

[For City or County projects with utility relocations:]

If existing public or private utilities conflict with the construction PROJECT, PERMITTEE will make necessary arrangements with the owners of such utilities for their protection, relocation, or removal. PERMITTEE shall inspect the protection, relocation, or removal of such facilities. Total costs of such protection, relocation, or removal which STATE or PERMITTEE must legally pay, will be borne by PERMITTEE. If any protection, relocation, or removal of utilities is required, including determination of liability for cost, such work shall be performed in accordance with STATE policy and procedure. PERMITTEE shall require any utility company performing relocation work in the STATE's right-of-way to obtain a State Encroachment Permit before the performance of said relocation work. Any relocated utilities shall be correctly located and identified on the as-built plans.

[For other projects with utility relocations:]

If existing public or private utilities conflict with the construction PROJECT, PERMITTEE will make necessary arrangements with the owners of such utilities for their protection, relocation, or removal. PERMITTEE shall inspect the protection, relocation, or removal of such facilities. Total costs of such protection, relocation, or removal shall be borne by PERMITTEE in compliance with the terms of the Highway Encroachment Permits, Case Law, Public Utility Regulations, and Property Rights. PERMITTEE shall require any utility company performing relocation work in the STATE's right-of-way to obtain a State Encroachment Permit before the performance of said relocation work. Any relocated utilities shall be correctly located and identified on the as-built plans.

PAGE 4: ATTACHED TO AND MADE PART OF PERMIT NO. 08-14-A-OP-0729

MANDATORY INSPECTIONS REQUIRED

IRRIGATION:

- a. Trenching and placing of supply lines.
- b. Pressure testing of supply lines.
- c. Backfill and compaction.
- d. Sprinklers and sprinkler coverage.
- e. Functional test.

PLANTING:

- a. Inspection Certificates (Nursery Stock Certificates) required by law shall accompany each shipment of plants. All plant materials and nursery invoices shall be inspected **prior** to planting.
- b. Designate plant locations.
- c. Preparation of planting areas and plant holes.
- d. Upon completion of planting.
- e. Additional inspections as determined by the Department's Representative may be required.

SOURCE OF MATERIALS:

Section 20 "Landscape" of the Standard Specifications states that the **contractor / permittee shall furnish a certificate of compliance for irrigation equipment, plant material, turf sod, soil amendment, and mulch.** Certificates shall be furnished to the Department's Representative **before** the material is incorporated in the work.

- If a registered Civil Engineer is chosen, in lieu of a registered Landscape Architect to perform the function of a Resident Engineer, the City/County shall furnish, at City/County's expense, and subject to the approval of State Representative, a landscape architect to perform the function of assistant "Resident Engineer" who is responsible for both daily on-site inspections and final decisions including but not limited to: the highway planting and irrigation system portions of the work. Final decisions shall continue to be subject to the satisfaction and approval of the State Representative.
- Upon completion of the landscape/irrigation installation, the property owner of record must apply for and obtain a fee exempt annual permit to perform landscape maintenance within the State right of way.

All work shall comply with the Department's current issue of STANDARD SPECIFICATIONS.

PAGE 5: ATTACHED TO AND MADE PART OF PERMIT NO. 08-14-A-OP-0729

PERMIT NO.: 08-14-A-OP-0729

CO/RTE/PM: 08/RIV/215/R17.8-R19.2

PRECONSTRUCTION MEETING AGREEMENT

I, _____, acting as an authorized agent for the permittee, _____, do hereby agree to personally accomplish or have another designated person arrange for all involved company representatives to attend a pre-construction meeting with the authorized Department's Representative at _____, as specified on this permit. Such meeting must be held two (2) days or more prior to the planned start of the work on this project. The Authorized Department's Representative shall have complete authority to determine whether the permit conditions, either implied or written, have been complied with. The Department's Representative may then allow the permit work to proceed as appropriate. The Pre-construction Meeting Record below must be signed by both the Department's Representative and the permittee before the permit work may start.

I have read and understand the attached General Provisions TR-0045 and other attached provisions of this permit.

This agreement or a copy thereof, must be mailed back to the **Department's District 8 Encroachment Permit Office at 464 W. 4th. Street, MS 619, San Bernardino, CA 92401-1400**, within three (3) working days prior to the pre-construction meeting. Failure to return this form could delay the release of your bonds. A copy of this document shall be at the job site at all times when work is in progress and failure to do so may result in the suspension of work, as directed by the Department's Representative.

It is the permittee's responsibility to insure that the Department's Representative is notified of work completion and that the attached Completion Notice is mailed to the Department's Permit office.

Signature Date

Print or Type Name

Position or Title

Appendix G

Environmental Permits

- 1. Department of the Army, May 28, 2014 (2 Pages)**
- 2. Department of the Army, July 2, 2013 (34 Pages)**
- 3. Department of Fish and Wildlife, January 22, 2014 (2 Pages)**
- 4. Santa Ana Region Water Quality Control Board,
September 25, 2013 (6 Pages)**



DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3401

May 28, 2014

Russell Williams, Principal Planner
Riverside County Transportation Department
3525 14th Street
Riverside, California 92502

Dear Mr. Williams,

This correspondence is in reply to your request, dated April 15, 2014, to modify your Department of the Army Permit verification (SPL-2010-00446-VCC), dated July 2, 2013. Your permit verification authorized the Riverside County Transportation Department to discharge permanent fill material into approximately 0.003 acre (15 linear feet) of wetland and 0.49 acre (1,600 linear feet) of non-wetland waters of the United States (WOUS). Additionally, the permit verification authorized the temporary discharge of dredged or fill material into approximately 0.04 acre (335 linear feet) of wetland and 0.45 acre (660 linear feet) of non-wetland WOUS to construct the Interstate 215/Newport Road Interchange Improvement Project. The proposed work would take place within Salt Creek and its unnamed tributary, in the City of Menifee, Riverside County, California.

Under the provisions of 33 C.F.R. section 325.7(b), Special Condition 3 is modified as follows:

3. Prior to initiating construction in WOUS, and to mitigate for permanent impacts to 0.003 acre of wetland and 0.49 acre of non-wetland WOUS and for temporary impacts to 0.04 acre of wetland and 0.45 acre of non-wetland WOUS, the Permittee shall provide documentation verifying purchase of credits for 2.0 acres of enhancement of WOUS, from a Corps-approved in-lieu fee program (i.e. Riverside-Corona Resource Conservation District In-Lieu Fee Program). The Permittee shall not initiate work in WOUS prior to receiving written confirmation (by letter or e-mail) from the Corps Regulatory Division as to compliance with this special condition. The Permittee retains responsibility for providing the compensatory mitigation until: 1) the number and resource type of credits described above have been secured from a sponsor and, 2) the Corps Regulatory Division has received documentation that confirms that the sponsor has accepted the responsibility for providing the required compensatory mitigation. This documentation may consist of a letter or receipt signed by the sponsor and shall include the permit number and a statement or receipt indicating the number and resource type of credits that have been secured from the sponsor.

The terms and conditions of your original permit verification (No. SPL-2010-00446-VCC), except as changed herein, or by other Corps and/or Regional Water Quality Control Board authorizations, incorporating additional special conditions or non-discretionary terms and

conditions of biological opinions rendered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, remain in full force and effect.

Thank you for participating in our regulatory program. If you have any questions, please contact Veronica Chan at 213-452-3292 or via e-mail at Veronica.C.Chan@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at:
http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Sincerely,



Mark D. Cohen
Deputy Chief, Regulatory Division



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

Los Angeles District Corps of Engineers

P.O. Box 532711

Los Angeles, CA 90017-3401

July 2, 2013

Regulatory Division

Russell Williams, Principal Planner
Riverside County Transportation Department
3525 14th Street
Riverside, California 92502

DEPARTMENT OF THE ARMY NATIONWIDE PERMIT VERIFICATION

Dear Mr. Williams,

This correspondence is in reply to your application, dated December 21, 2012, for a Department of the Army Permit. Your proposed project, Interstate 215/Newport Road Interchange Improvement Project, would result in discharges of permanent fill into approximately 0.003 acre (15 linear feet) of wetland and 0.49 acre (1,600 linear feet) of non-wetland waters of the U.S. and temporarily discharge dredged or fill material into approximately 0.04 acre (335 linear feet) of wetland and 0.45 acre (660 linear feet) of non-wetland waters of the U.S. Therefore, pursuant to section 404 of the Clean Water Act (33 U.S.C. 1344; 33 C.F.R. parts 323 and 330), your proposed project requires a Department of the Army permit. The proposed work would take place within an unnamed tributary to Salt Creek and within Salt Creek, in the City of Menifee, Riverside County, California (see attached figures).

I have determined construction of Interstate 215/Newport Road Interchange Improvement Project complies with Nationwide Permit (NWP) No. 14, Linear Transportation Projects, if conducted as described in your application. This letter covers multiple verifications, listed below.

Specifically, you are authorized to (as shown on the enclosed figures):

- Discharge permanent fill material into approximately 0.003 acre (15 linear feet) of wetland and 0.49 acre (1,600 linear feet) of non-wetland waters of the U.S. and temporarily discharge dredged or fill material into approximately 0.04 acre (335 linear feet) of wetland and 0.45 acre (660 linear feet) of non-wetland waters of the U.S. to construct the Interstate 215/ Newport Road Interchange Improvement Project at the following locations:
 - Feature 1: Permanent: 0.46 acre (20,080 square feet) non-wetland waters of the U.S.; and Temporary: 0.06 acre (2,750 square feet) non-wetland waters of the U.S.
 - Salt Creek: Permanent: 0.003 acre (140 square feet) wetland and 0.03 acre (1,310 square feet) non-wetland waters of the U.S.; and Temporary: 0.04 acre (1,570 square feet) wetland and 0.39 acre (17,040 square feet) non-wetland waters of the U.S.

For this NWP No. 14 verification letter to be valid, you must comply with all of the terms and conditions in Enclosure 1. Furthermore, you must comply with the following non-discretionary Special Conditions listed below:

1. This verification is contingent upon issuance of a Clean Water Act (CWA) Section 401 Water Quality Standards Certification. The Permittee shall submit the section 401 Water Quality Standards Certification to the Corps Regulatory Division at least 15 days prior to start of work within waters of the U.S. The Permittee shall abide by the terms and conditions of the section 401 Water Quality Standards Certification.
2. Prior to initiating construction in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a complete set of final detailed grading/construction and drainage plans showing all work areas and structures in waters of the U.S. All plans shall be in compliance with the Final Map and Drawing Standards for the Los Angeles District Regulatory Division dated August 6, 2012 (http://www.spl.usace.army.mil/Portals/17/docs/regulatory/Permit_Process/SPD-RG_map-drawing-standards_final_20120806v3.pdf). All plan sheets shall be signed, dated, and submitted on paper no larger than 8.5 x 11 inches. No work in waters of the U.S. is authorized until the Permittee receives, in writing (by letter or e-mail), Corps Regulatory Division approval of the final detailed grading/construction plans. The Permittee shall ensure that the project is built in accordance with the Corps Regulatory Division-approved plans.
3. Prior to initiating construction in waters of the U.S., and to mitigate for permanent impacts to 0.003 acre of wetland and 0.49 acre of non-wetland waters of the U.S. and for temporary impacts to 0.04 acre of wetland and 0.45 acre of non-wetland waters of the U.S., the Permittee shall provide documentation verifying purchase of 2.0 acres credits for the enhancement of wetlands from a Corps-approved in-lieu fee program (i.e. Riverside-Corona Resource Conservation District In-Lieu Fee Program). The Permittee shall not initiate work in waters of the U.S. prior to receiving written confirmation (by letter or e-mail) from the Corps Regulatory Division as to compliance with this special condition. The Permittee retains responsibility for providing the compensatory mitigation until the number and resource type of credits described above have been secured from a sponsor and the Corps Regulatory Division has received documentation that confirms that the sponsor has accepted the responsibility for providing the required compensatory mitigation. This documentation may consist of a letter or receipt signed by the sponsor, with the permit number and a statement indicating the number and resource type of credits that have been secured from the sponsor.
4. The Permittee shall clearly mark the limits of the workspace with flagging or similar means to ensure mechanized equipment does not enter avoided waters of the U.S. areas shown in the attached figures. Adverse impacts to waters of the U.S. beyond the Corps Regulatory Division-approved construction footprint are not authorized. Such impacts could result in permit suspension and revocation, administrative, civil or criminal penalties, and/or substantial, additional, compensatory mitigation requirements.
5. Upon project completion, all temporary fills shall be removed and all temporarily affected streams shall be re-contoured to pre-construction conditions. In addition, the Permittee shall

hydroseed, where possible, the disturbed portions of the earthen stream banks with native, non-invasive species, as appropriate to the affected areas, to reduce the potential for erosion. The Permittee shall submit the proposed planting palette for review and approval by the Corps Regulatory Division prior to initiation of construction. The Permittee shall ensure the hydroseeded areas are maintained and monitored for a period of two years after completing the seeding activities, such that less than 10 percent of the areas disturbed by the project are vegetated by non-native and invasive plant species. For each project drainage feature, the Permittee shall submit a memorandum by December 15th after completion of the two year maintenance and monitoring period. The memo shall indicate for each project crossing/impact area, when temporary construction areas were re-contoured to pre-construction conditions, when native seeding was completed, the species and percent cover (absolute) of invasive and/or non-invasive plant species that occur onsite each year prior to treatment, and when and how many/the extent of invasive and/or non-invasive plant species were removed that year.

6. Within 45 calendar days of completing authorized work in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a memo including the following:
 - A) Date(s) work within waters of the U.S. was initiated and completed;
 - B) Summary of compliance status with each special condition of this permit (including any noncompliance that previously occurred or is currently occurring and corrective actions completed or being taken to achieve compliance);
 - C) Color photographs taken at the project site before and after construction for those aspects directly associated with impacts to waters of the U.S.; and
 - D) One copy of as-built drawings for the entire project (all sheets must be signed, dated, to-scale, and no larger than 8.5 x 11 inches); and
 - E) Signed Certification of Compliance.

Cultural Resources:

7. Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall notify the Corps' Regulatory Division and Archeology staff (Steve Dibble at 213-452-3849 or John Killeen at 213-452-3861) within 24 hours. The Permittee shall immediately suspend all work within 100 feet of any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps Regulatory Division re-authorizes project construction, per 36 C.F.R. section 800.13.

Your verification is valid through March 18, 2017. All nationwide permits will expire on March 18, 2017. It is incumbent upon you to remain informed of changes to the nationwide permits. A public notice of the change(s) will be issued when any of the NWP's are modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date on which the relevant NWP is reissued, modified, or revoked, you will have twelve (12) months from the date of the reissuance, modification, or revocation of the NWP to complete the activity under the present terms and conditions of the relevant NWP.

A NWP does not grant any property rights or exclusive privileges. Additionally, it does not authorize any injury to the property, rights of others, nor does it authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have any questions, please contact Veronica Chan at 213-452-3292 or via e-mail at Veronica.C.Chan@usace.army.mil.

Please complete the customer survey form at <http://per2.nwp.usace.army.mil/survey.html>, which would help me to evaluate and improve the regulatory experience for others.

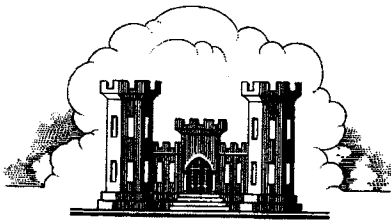
"Building Strong and Taking Care of People!"

Sincerely,



Mark D. Cohen
Deputy Chief, Regulatory Division

Enclosure(s)



**LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS**

**CERTIFICATE OF COMPLIANCE WITH
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT**

Permit Number: *SPL-2010-00446-VCC*

Name of Permittee: Riverside County Transportation Department (*POC: Russell Williams*)

Date of Issuance: *July 2, 2013*

Upon completion of the activity authorized by this permit and the mitigation required by this permit, sign this certificate, and return it to the following address:

U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division
ATTN: CESPL-RG-SPL-2010-00446-VCC
P.O. Box 532711
Los Angeles, CA 90017-3401

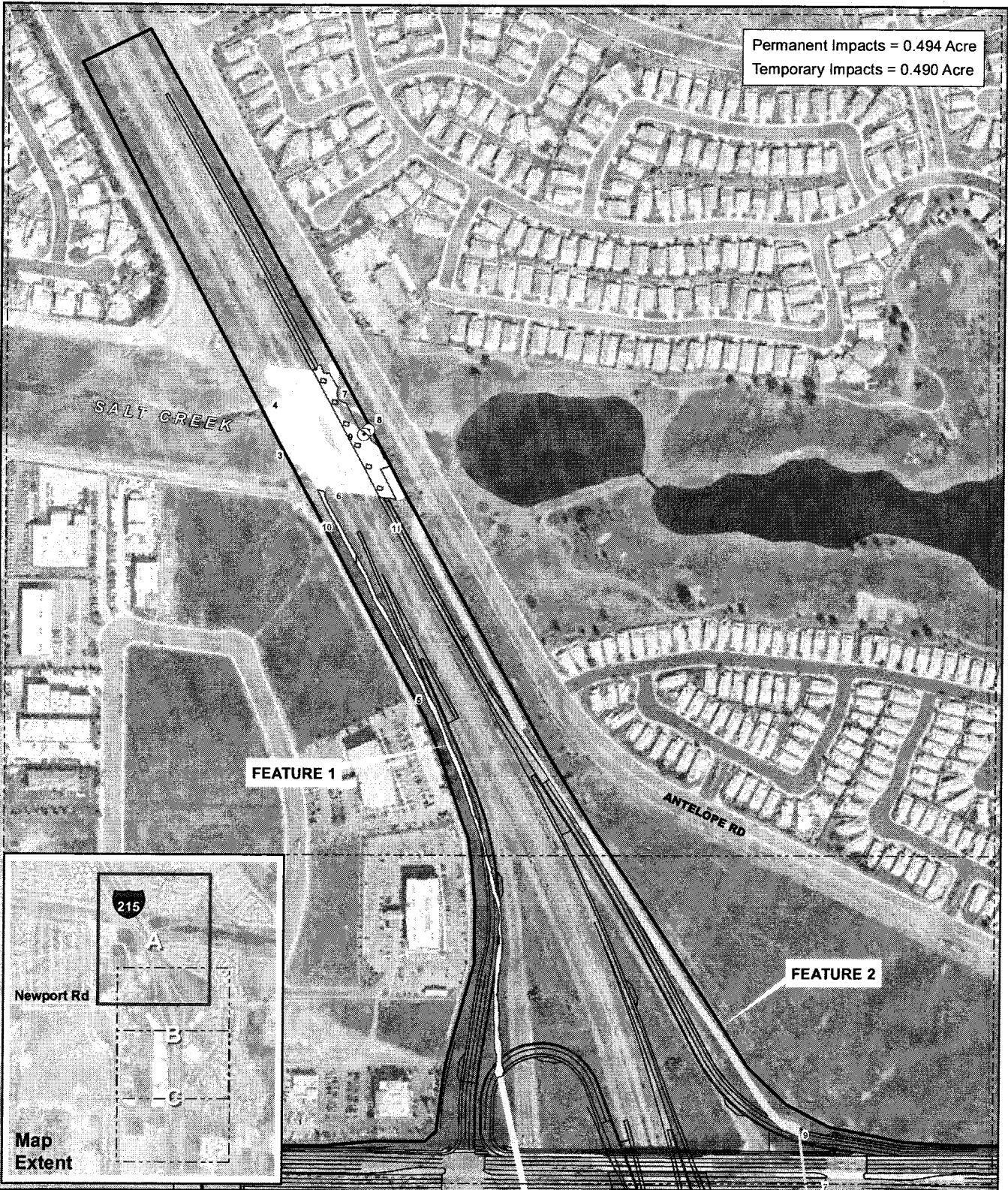
Please note that your permitted activity is subject to a compliance inspection by an Army Corps of Engineers representative. If you fail to comply with this Nationwide Permit, you may be subject to permit suspension, modification, or revocation procedures as contained in 33 C.F.R. § 330.5 or enforcement procedures such as those contained in 33 C.F.R. §§ 326.4 and 326.5.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit condition(s).

Signature of Permittee

Date

Permanent Impacts = 0.494 Acre
 Temporary Impacts = 0.490 Acre



I:\215_Videning\MXD\Newport Interchange\Revised_01May2012\Figure_04A_CWA_Jurisdictional_Determination.mxd

▲ Photo Location and Direction	■ Seasonal Wetland WoUS OHWM Limits
⊙ Soil Pit	■ Non-Wetland Other WoUS OHWM Limits
— Proposed Roadway Improvements	■ Upland (Non Jurisdictional)
□ Study Area	■ Non-Jurisdictional Feature
--- Sheet Matchline	□ Permanent
	□ Temporary

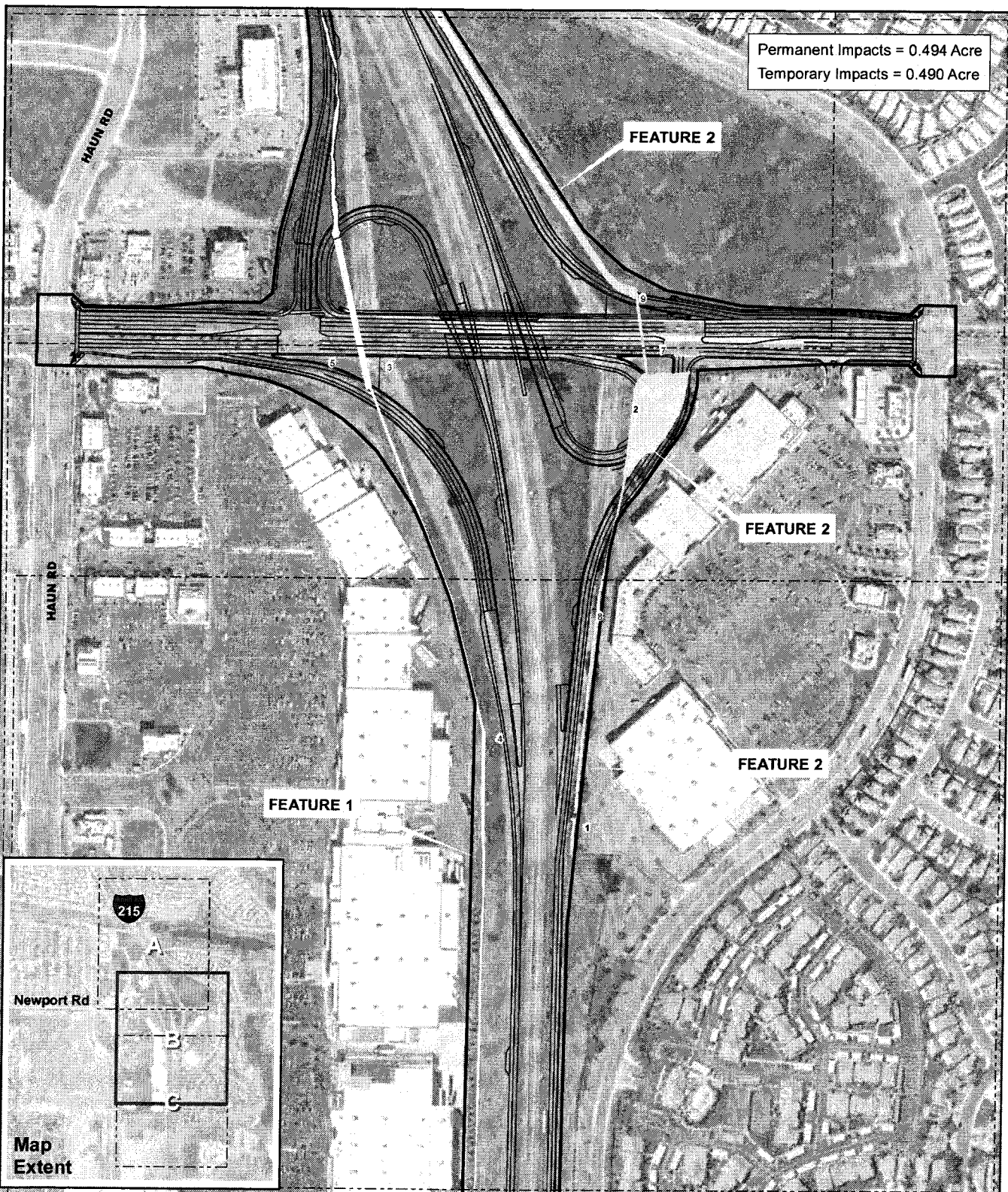
0 400 Feet

FIGURE 4A
 CLEAN WATER ACT (SECTIONS 401 AND 404)
 JURISDICTIONAL DETERMINATION

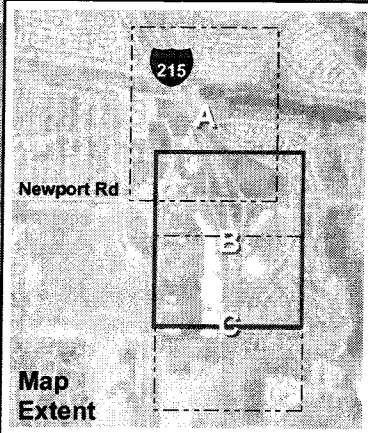
**I-215/NEWPORT ROAD
 INTERCHANGE PROJECT**



Permanent Impacts = 0.494 Acre
 Temporary Impacts = 0.490 Acre



I:\215_Widening\MXD\Newport Interchange\Revised_01May2012\Figure_04A_CWA_Jurisdictional_Determination.mxd



▲ Photo Location and Direction	■ Seasonal Wetland WoUS OHWM Limits
○ Soil Pit	■ Non-Wetland Other WoUS OHWM Limits
— Proposed Roadway Improvements	■ Upland (Non Jurisdictional)
□ Study Area	■ Non-Jurisdictional Feature
--- Sheet Matchline	□ Permanent
	□ Temporary

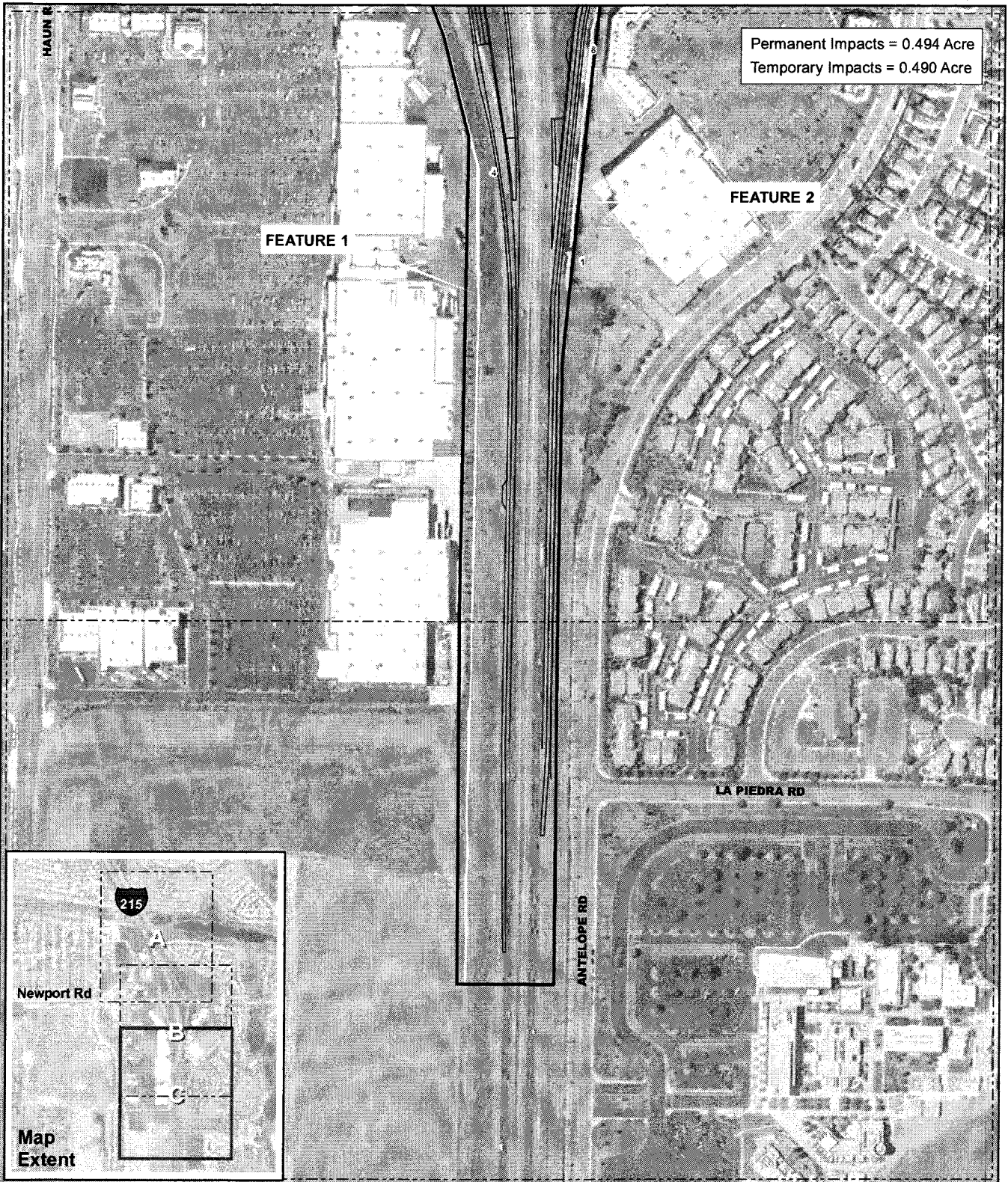
0 400
Feet

FIGURE 4B
 CLEAN WATER ACT (SECTIONS 401 AND 404)
 JURISDICTIONAL DETERMINATION

**I-215/NEWPORT ROAD
 INTERCHANGE PROJECT**

URS

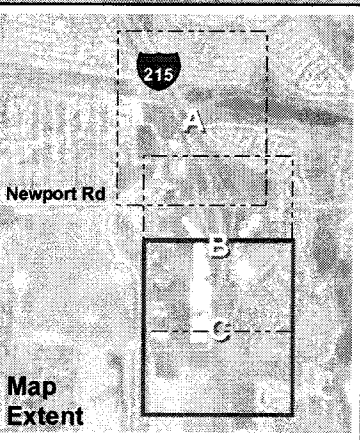
I-215_Widening\MXD\Newport Interchange\Revised_01May2012\Figure_04A_CWA_Jurisdictional_Determination.mxd



Permanent Impacts = 0.494 Acre
 Temporary Impacts = 0.490 Acre

FEATURE 1

FEATURE 2



<ul style="list-style-type: none"> Photo Location and Direction Soil Pit Proposed Roadway Improvements Study Area Sheet Matchline 	<ul style="list-style-type: none"> Seasonal Wetland WoUS OHWM Limits Non-Wetland Other WoUS OHWM Limits Upland (Non Jurisdictional) Non-Jurisdictional Feature Permanent Temporary
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

0 400 Feet

FIGURE 4C
 CLEAN WATER ACT (SECTIONS 401 AND 404)
 JURISDICTIONAL DETERMINATION

**I-215/NEWPORT ROAD
 INTERCHANGE PROJECT**

URS

NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. SEE LAYOUT PLANS FOR EXACT LOCATIONS OF HMA DIKE.
3. SYSTEM Nos. NOT USED: **36**

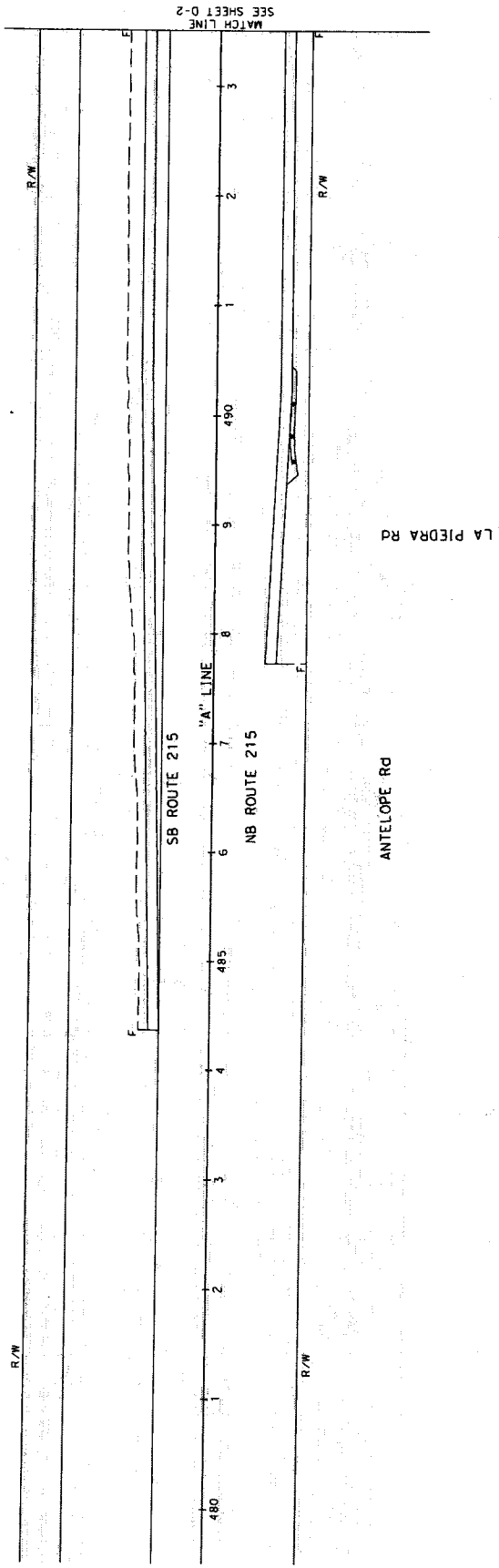
LEGEND:

- DRAINAGE SYSTEM NUMBER
- DRAINAGE UNIT DESIGNATION
- ROCK SLOPE PROTECTION
- BIOFILTRATION SWALE
- TEMPORARY FENCE (TYPE ESA)

ABBREVIATIONS:

- GLD GRATED LINE DRAIN
- BFS BIOFILTRATION SWALE
- Dep DEPRESSION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	RIV	215	R17.4/R19.3		
REGISTERED CIVIL ENGINEER					
DATE: X-XX-YY					
PLANS APPROVAL DATE: No. 69431					
THE STATE OF CALIFORNIA BEING HEREBY CERTIFIED THAT THE ABOVE PLANS AND SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL CIVIL ENGINEER IN THE STATE OF CALIFORNIA.					
BRUCE CORPORATION TRANSPORTATION DEPARTMENT 4090 LEMON STREET, 8TH FLOOR SAN ANTONIO, TEXAS 78201 SANITA ANA, CA 92705					



60% SUBMITTAL
 NOT FOR CONSTRUCTION
 SEPTEMBER 13, 2012

DRAINAGE PLAN
 SCALE 1" = 50'

APPROVED FOR DRAINAGE WORK ONLY

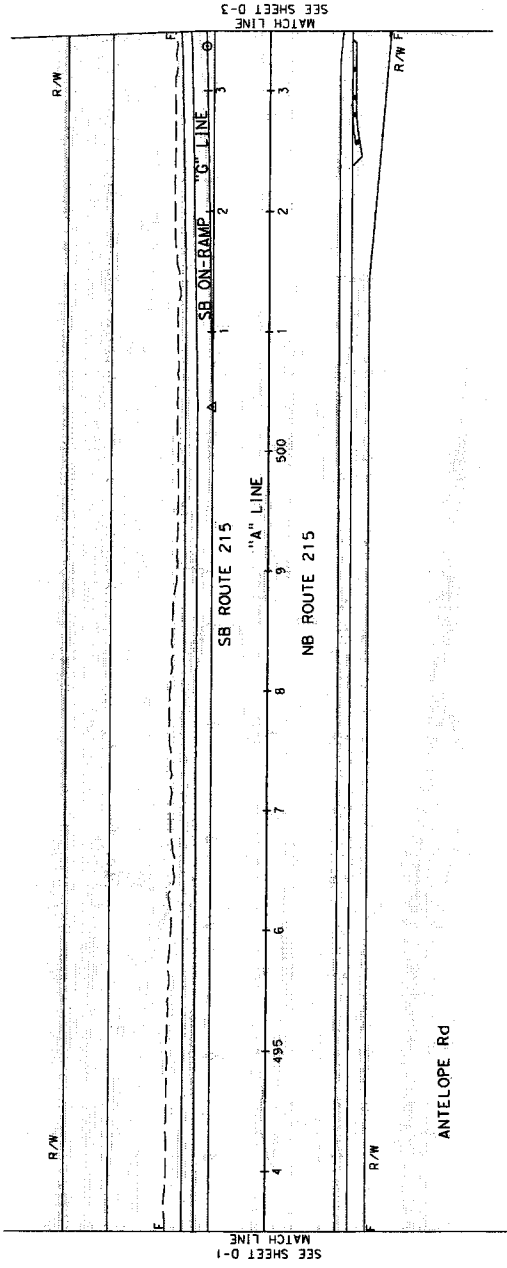
Dist#	COUNTY	ROUTE	POST MILE	SHEET TOTAL
08	Riv	215	R17.4/R19.3	1 OF 2 SHEETS

REGISTERED CIVIL ENGINEER	DATE	APPROVAL

PLANS APPROVAL DATE	REGISTERED CIVIL ENGINEER

THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	RIVERSIDE COUNTY
SANTA ANA, CA 92702	RIVERSIDE COUNTY

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



60% SUBMITTAL
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2012

DRAINAGE PLAN
SCALE 1"= 50'

APPROVED FOR DRAINAGE WORK ONLY

PROJECT NUMBER & PHASE
UNIT 0000

RELATIVE BORDER SCALE
IS IN INCHES

USERNAME: j...
DATE PLOTTED: 9/13/2012

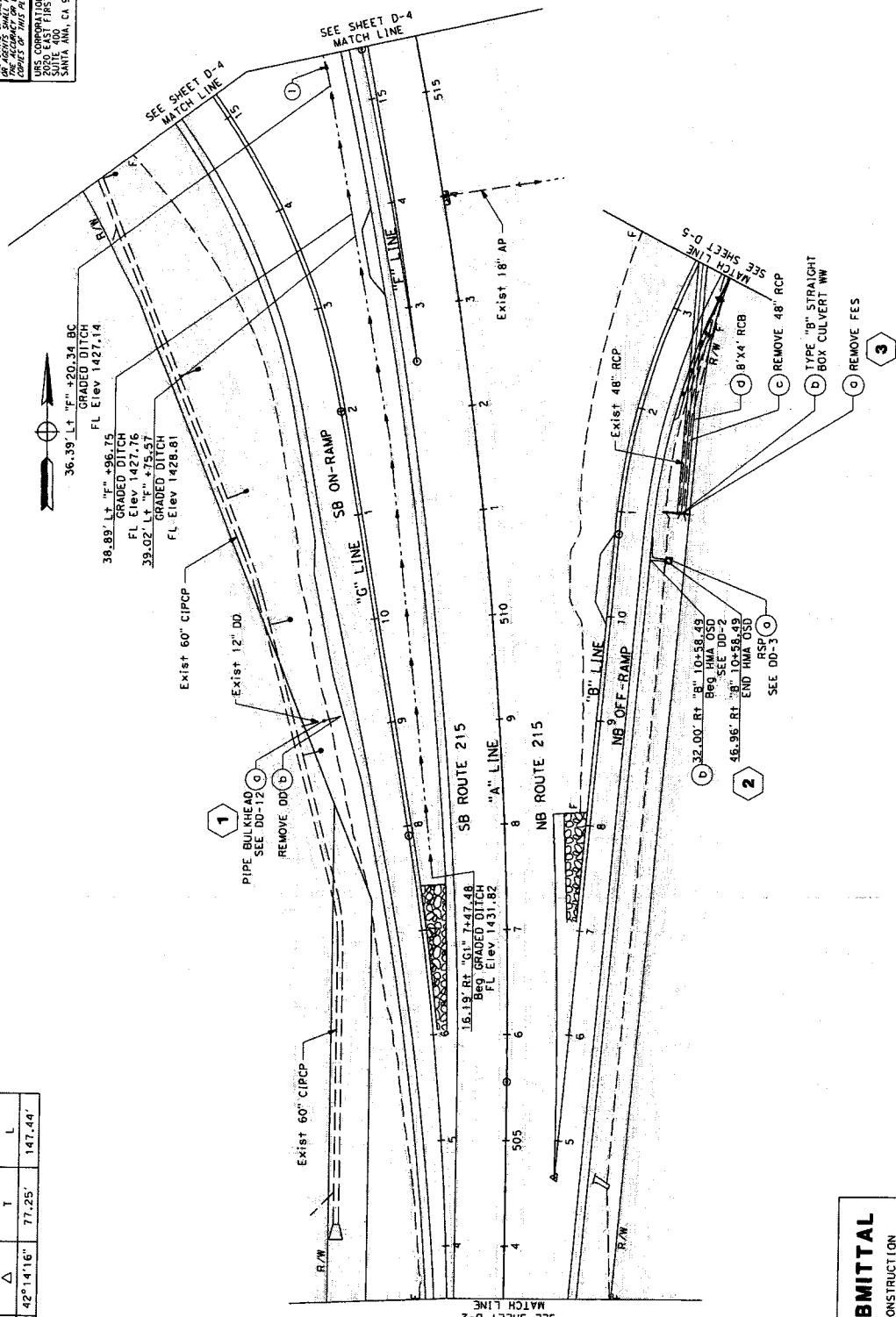
BORDER LAST REVISED 7/2/2010

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	JEFFREY G. CHAPMAN	CHECKED BY	DATE REVISED
	DESIGNED BY		REVISOR	

NOTE:
FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERS AT THE DISTRICT OFFICE.

CURVE DATA			
R	Δ	T	L
200.00'	42° 14' 16"	77.25'	147.44'

Dist	County	Route	Sheet
08	Riv	215	R17.4/R19.3
REGISTERED CIVIL ENGINEER		DATE	X-XX-XX
PLANS APPROVAL DATE			
USE CONSTRUCTION OF THIS PLAN AS A GUIDE ONLY. THE ENGINEER'S OFFICE OR AGENT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE DATA OR THE COMPLETENESS OF THE PLAN.			
RIVERSIDE COUNTY 2030 EAST FIRST STREET, SUITE 400 SANTA ANA, CA 92705			



60% SUBMITTAL
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2012

DRAINAGE PLAN
SCALE 1" = 50'
D-3

APPROVED FOR DRAINAGE WORK ONLY

DATE PLOTTED: 9/11/2012 12:54:31 PM
PROJECT NUMBER & PHASE: 08000000301
UNIT: 0000
RELATIVE BORDER SCALE: 1/8" = 1' INCHES
BORDER LAST REVISED: 7/2/2010
USERNAME: jresu.d12z
DEN FILE: ...\\08000000301\ed03.dgn

DATE: 08-11-2012
 TIME PLOTTED: 9/11/2012 12:54:33 PM

DATE: 08-11-2012
 TIME PLOTTED: 9/11/2012 12:54:33 PM

DATE: 08-11-2012
 TIME PLOTTED: 9/11/2012 12:54:33 PM

REGISTERED CIVIL ENGINEER
 Y-XX-XX
 DATE: 6/20/03
 BRIM D. PAISCHULL
 No. 69431
 CIVIL
 STATE OF CALIFORNIA
 REGISTERED CIVIL ENGINEER

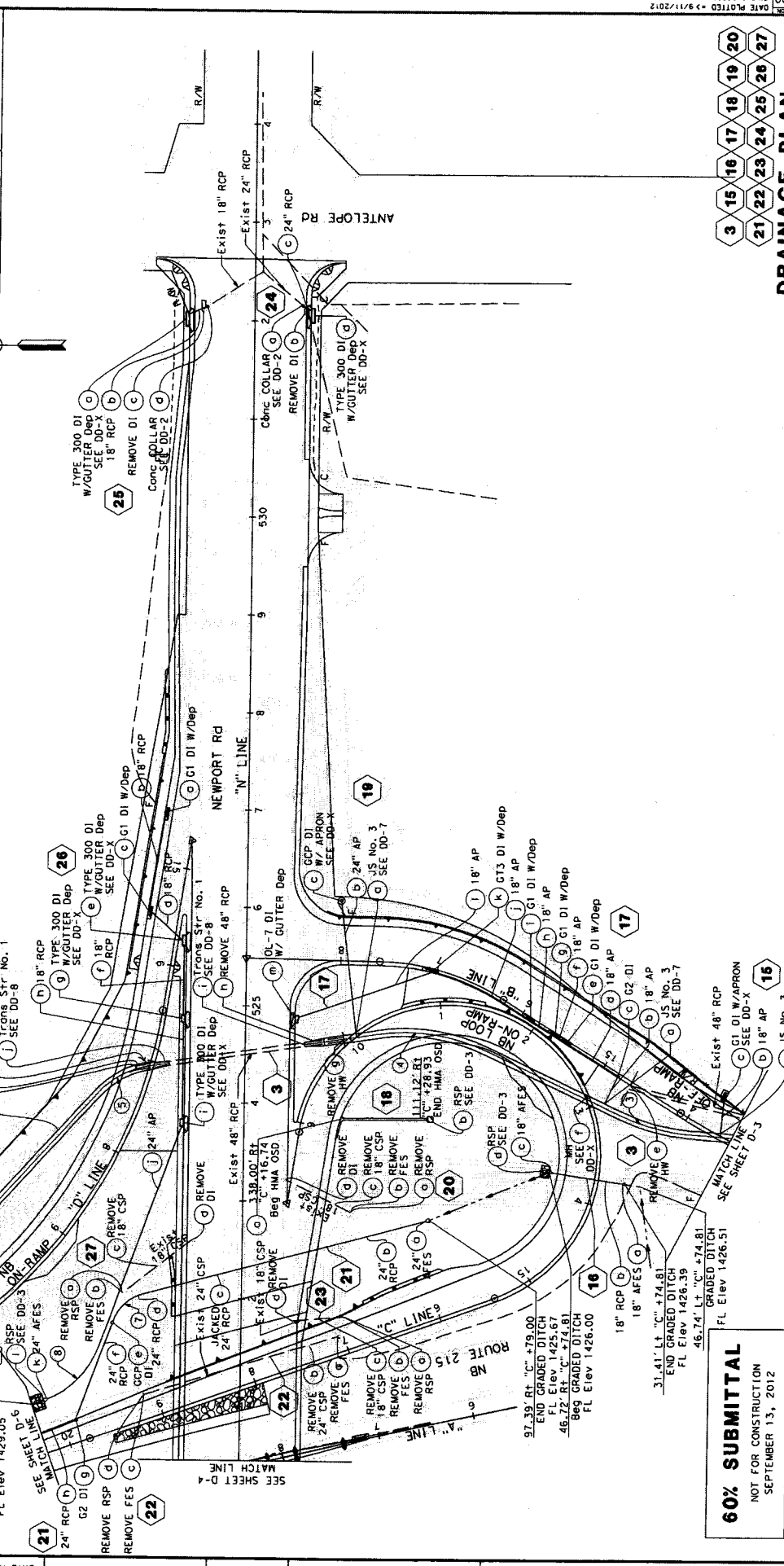
PLANS APPROVAL DATE: 6/20/03

REGISTERED CIVIL ENGINEER
 Y-XX-XX
 DATE: 6/20/03
 BRIM D. PAISCHULL
 No. 69431
 CIVIL
 STATE OF CALIFORNIA
 REGISTERED CIVIL ENGINEER

USERS OF COUNTY OF SAN DIEGO TRANSPORTATION DEPARTMENT
 4800 LEON STREET, 8TH FLOOR
 SAN DIEGO, CA 92108

CURVE DATA				
R	Δ	T	L	
200.00'	20° 40' 08"	36.47'	72.15'	
200.00'	33° 45' 34"	60.69'	117.84'	
90.00'	38° 59' 01"	31.86'	61.24'	
200.00'	13° 31' 47"	23.72'	47.23'	
45.00'	55° 03' 52"	23.46'	43.25'	
90.00'	48° 47' 42"	40.82'	76.65'	

NOTE:
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



DRAINAGE PLAN
 SCALE 1" = 50'

PROJECT NUMBER & PHASE
 UNIT 0000

APPROVED FOR DRAINAGE WORK ONLY

RELATIVE BORDER SCALE
 15" IN INCHES

DATE: 08-11-2012
 TIME PLOTTED: 9/11/2012 12:54:33 PM

60% SUBMITTAL
 NOT FOR CONSTRUCTION
 SEPTEMBER 13, 2012

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
 CONSULTANT FUNCTIONAL SUPERVISOR
 JEFFREY G. CHAPMAN
 CHECKED BY
 DATE REVISED BY

USER NAME: j7jrus_0102
 JOB FILE # : ...080000001.dwg.cgm

BORDER LAST REVISED 7/2/2010

Dist: COUNTY ROUTE 215 R17.4/R19.3 XXX

REGISTERED CIVIL ENGINEER DATE: X, XX-XX

PLANS APPROVAL DATE: 6/20/23

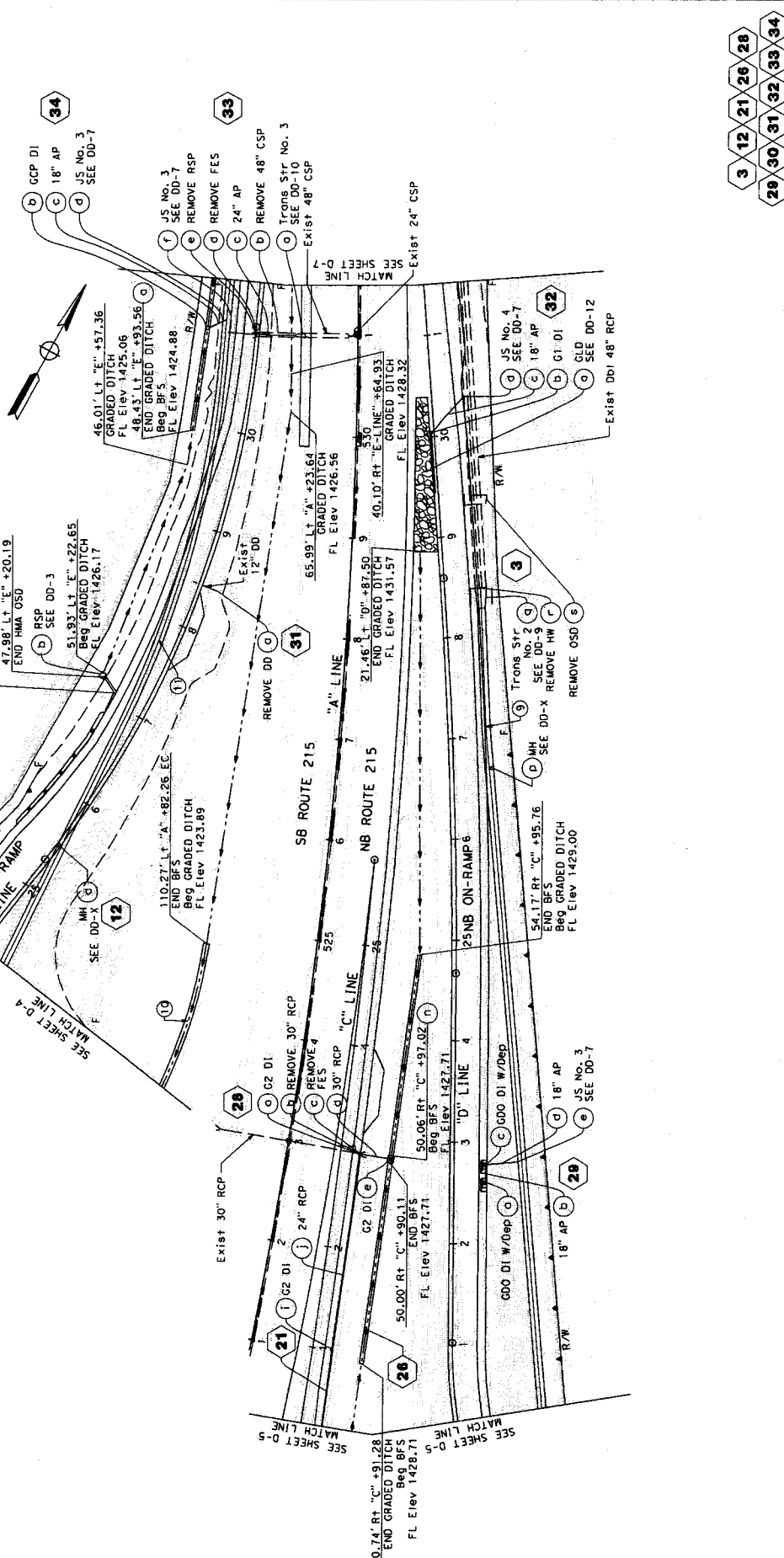
REGISTERED CIVIL ENGINEER: BRIAN D. PATSCHALL No. 69431

UNIVERSITY COUNTY TRANSPORTATION DEPARTMENT 4080 LEMON STREET 8TH FLOOR SANTA ANA, CA 92705

PROJECT NO. 0800000301

NOTE: FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA			
R	Δ	T	L
500.00'	2°29'13"	10.85'	21.70'
500.00'	17°29'23"	79.15'	156.99'
1000.00'	20°50'28"	183.91'	363.75'



DATE PLOTTED: 9/11/2012 12:54:43 PM

PROJECT NUMBER & PHASE: 0800000301

UNIT: 0000

RELATIVE BORDER SCALE: 15 IN. INCHES

APPROVED FOR DRAINAGE WORK ONLY

US: 0800000301.dwg

DATE: 7/2/2010

APPENDIX G (Page 16 of 44)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR: JEFFREY G. CHAPMAN

CHECKED BY: [Signature]

DESIGNED BY: [Signature]

DATE REVISED: [Blank]

REVISIONS: [Blank]

DATE: 7/2/2010

PROJECT NUMBER & PHASE: 0800000301

UNIT: 0000

RELATIVE BORDER SCALE: 15 IN. INCHES

APPROVED FOR DRAINAGE WORK ONLY

DATE PLOTTED: 9/11/2012 12:54:43 PM

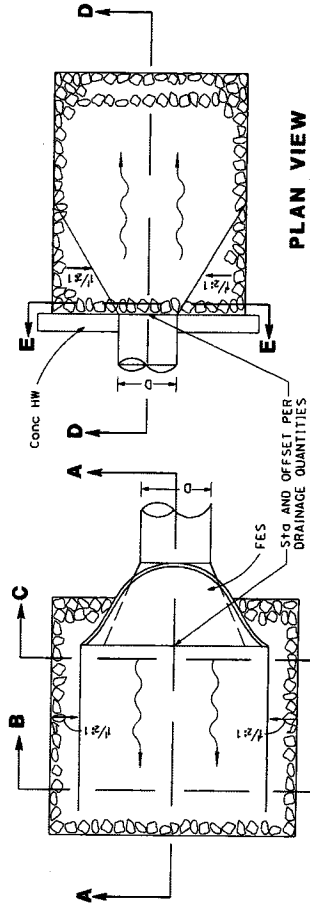
DIRTY COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08 RIV	215	R17.4/R19.3	XXX	XXX

REGISTERED CIVIL ENGINEER DATE X-XX-XX
 PROFESSIONAL ENGINEER
 BRIM D. PASCHULL
 No. 69431
 Exp. 8/28/15
 CIVIL
 THE STATE OF CALIFORNIA OR ITS OFFICES OR ANY CITY OR COUNTY SHALL NOT BE RESPONSIBLE FOR THE CORRECTNESS OF THIS PLAN SHEET.
 URS CORPORATION
 RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT
 2007 EAST FIRST STREET,
 SANTA ANA, CA 92705
 RIVERSIDE, CA 92502

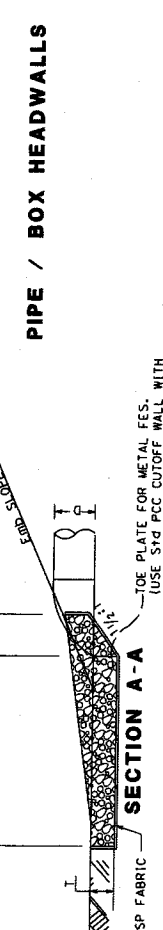
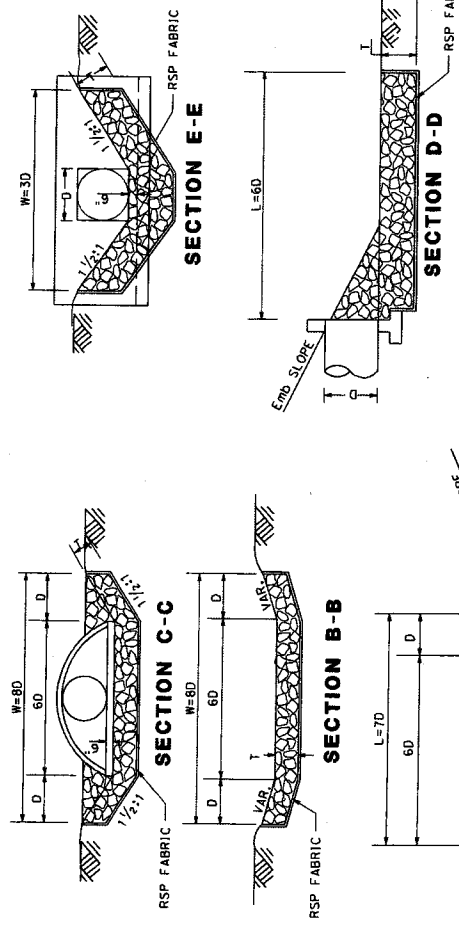
ROCK SLOPE PROTECTION	
BACKING No. 2 METHOD B	LIGHT
DRAINAGE SYSTEM UNIT No.	DRAINAGE SYSTEM UNIT No.
2 39	3
16	9
18	12
30	26

CLASS OF RSP	T (FT)
BACKING No. 2	1.0
LIGHT	2.0

LEGEND:
 D - DIAMETER OF PIPE OR RCB TOTAL WIDTH
 T - THICKNESS OF RSP
 L - LENGTH OF RSP
 W - WIDTH OF RSP
 * DIMENSION PER DETAILS, UNLESS OTHERWISE SHOWN



NOTE:
 FOR AFES DIMENSIONS
 SEE STD PLANS D94A AND D94B



TOE PLATE FOR METAL FES.
 USE STD RCC CURB OFF WALL WITH PRECAST CONC FES)

FLARED END SECTION

60% SUBMITTAL
 NOT FOR CONSTRUCTION
 SEPTEMBER 13, 2012

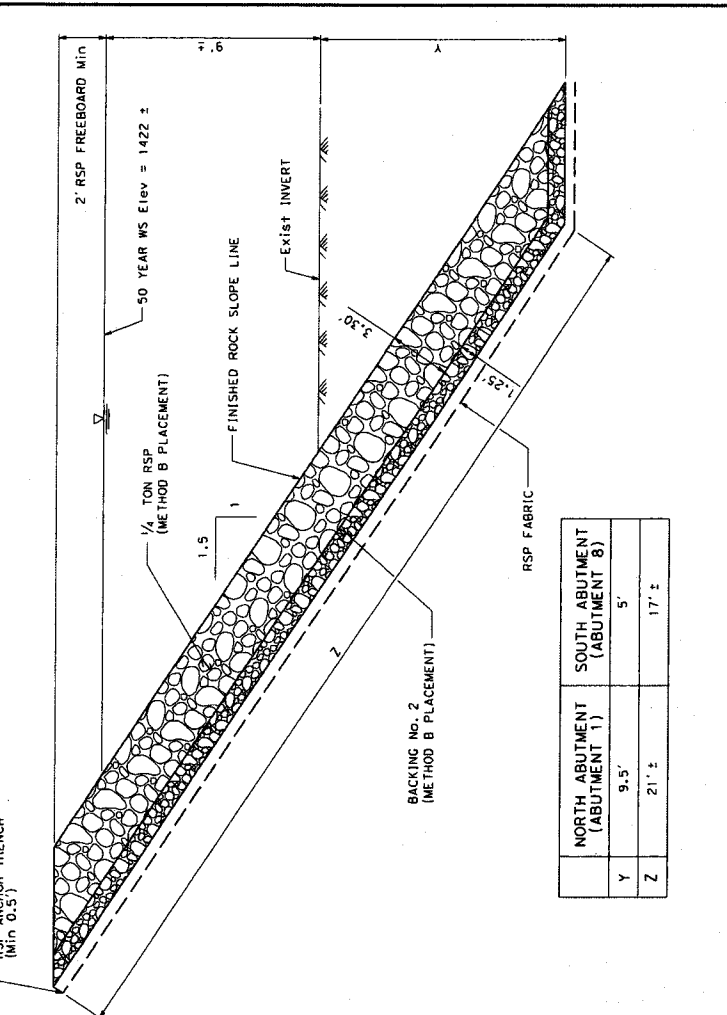
ROCK SLOPE PROTECTION

DRAINAGE DETAILS

NO SCALE

DD-3

Dist COUNTY ROUTE TOTAL PROJECT SHEET NO. SHEETS
 08 Riv 215 R17.4/R19.3 XXX
 REGISTERED CIVIL ENGINEER DATE X-XX-XX PROJECTS FROM LICENSE
 BRIAN P. PAISICALL
 No. 659431
 Exp. 8/20/14
 CIVIL
 RIVERSIDE COUNTY
 4080 LEMON STREET 8TH FLOOR
 SANTA ANA, CA 92702

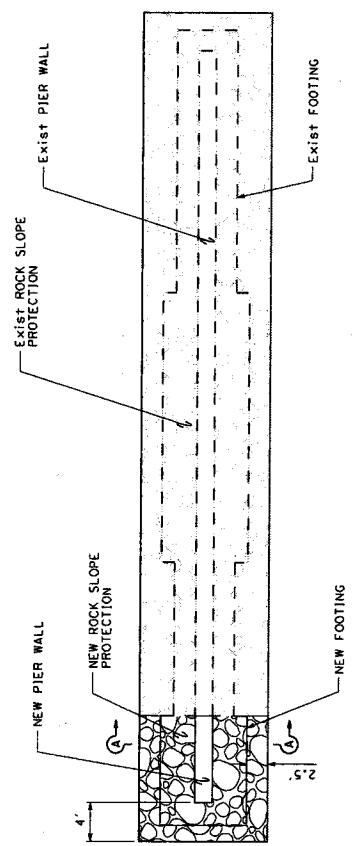


	NORTH ABUTMENT (ABUTMENT 1)	SOUTH ABUTMENT (ABUTMENT B)
Y	9.5'	5'
Z	21' ±	17' ±

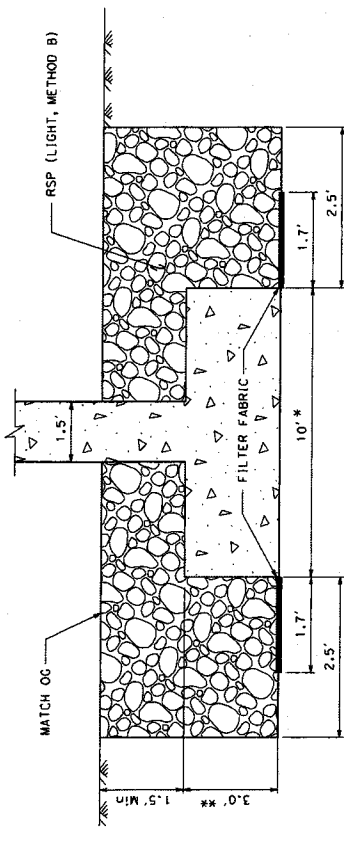
SALT CREEK BRIDGE ABUTMENTS ROCK SLOPE PROTECTION DETAIL



DRAINAGE DETAILS DD-4
 NO SCALE
 PROJECT NUMBER & PHASE 0800000301



PLAN



SECTION A-A

* NEW FOOTING WIDTH SHOWN. EXIST FOOTING IS 6' WIDE.
 ** NEW FOOTING THICKNESS SHOWN. EXIST FOOTING IS 2' THICK.

SALT CREEK BRIDGE PIER WALLS ROCK SLOPE PROTECTION DETAIL



60% SUBMITTAL
 NOT FOR CONSTRUCTION
 SEPTEMBER 13, 2012

BORDER LAST REVISED 7/2/2010 USERNAME: j7jeada_0102 DSN: FILE: ...0800000301.dwg

DIST. COUNTY: 08 RIV. ROUTE: 215. TOTAL PROJECT SHEET: R17.4 - R19.3. SHEET NO.: 19.

REGISTERED CIVIL ENGINEER: X. DATE: X. PROFESSIONAL ENGINEER: X.

PLANS APPROVAL DATE: X. METRIC: 4213. CIVIL: 2017/11. STATE OF CALIFORNIA: 2017/11.

RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT
4080 LEMON STREET 8TH FLOOR
RIVERSIDE, CA. 92502

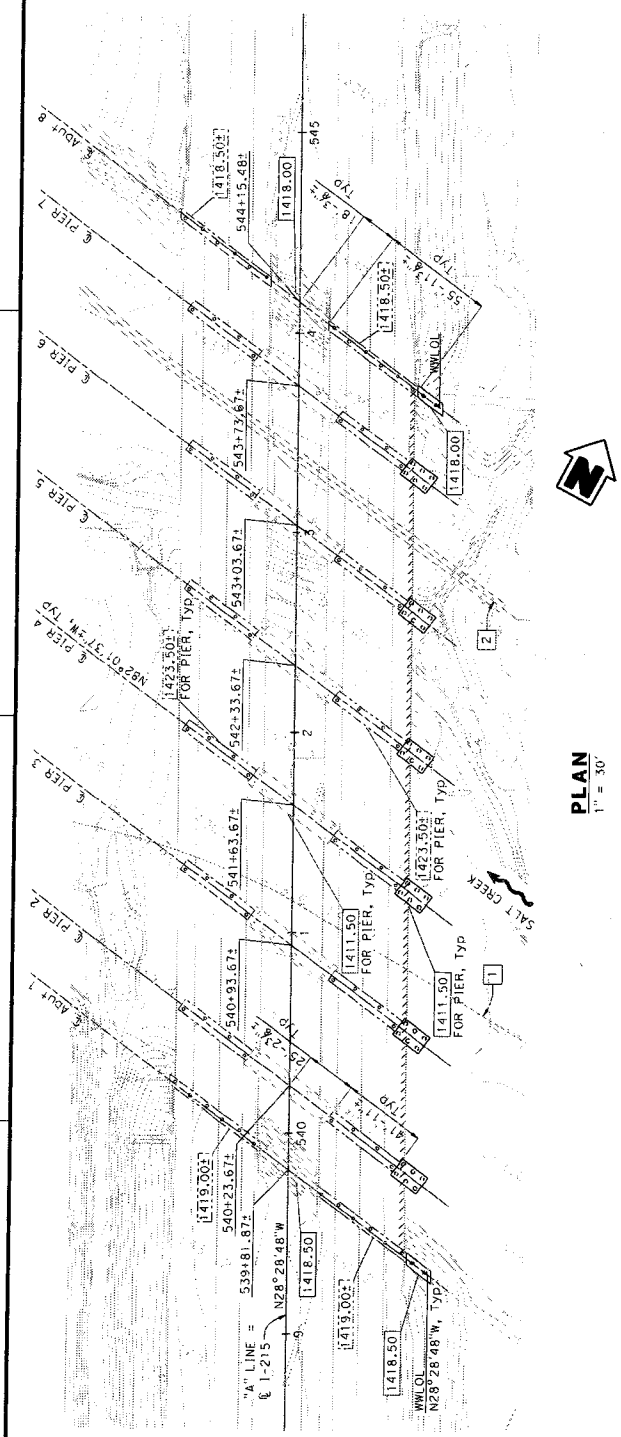
URS CORPORATION
2020 EAST FIRST STREET SUITE 400
SANTA ANA, CA. 92705

LEGEND:

- Indicates bottom of existing footing elevation
- Indicates bottom of footing elevation
- Indicates CIDH Concrete Pile
- Indicates Existing CIDH Concrete Pile
- Existing Structure

NOTES:

- All Piles not shown.
- Locations of existing structure foundations are approximate.



PILE DATA TABLE

LOCATION	PILE TYPE	NOMINAL RESISTANCE	DESIGN TIP ELEVATION (ft)	SPECIFIED TIP ELEVATION (ft)	DOWDRAG (kips)
Abut 1	24" CIDH	360	1383(a), 1384(d)	1383	122.5
Bent 2	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	70.6
Bent 3	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	51.5
Bent 4	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	51.5
Bent 5	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	51.5
Bent 6	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	51.5
Bent 7	24" CIDH	380	1363(a), 1375(b), 1381(d)	1363	70.6
Abut 8	24" CIDH	360	1383(a), 1384(d)	1383	90

NOTES:

- Design tip elevation for abutment are controlled by: (a) Compression, (b) Tension, (c) Lateral Load.
- Design tip elevation for bents are controlled by: (a) Compression, (b) Tension, (c) Lateral Load.
- The specified tip elevations shall accommodate the design tip elevations for lateral load.
- The specified tip elevation for CIDH shall not be raised.

NOTE: The contractor shall verify all controlling field dimensions before ordering or fabricating any material.

DESIGN	BY: M. HORNO	CHECKED	DATE: 11/17/2017
DETAILS	BY: M. HORNO	CHECKED	DATE: 11/17/2017
QUANTITIES	BY: M. HORNO	CHECKED	DATE: 11/17/2017
DESIGN GENERAL PLAN SHEET (ENCLOSURE REV. 7/4/20)			

BENCHMARK

NAME	NORTHING (ft)	EASTING (ft)	ELEV (ft)	DESCRIPTION
Z10063	2,188,826.30	6,281,368.35	1440.39	2 1/2" CALIFORNIA DIVISION OF HIGHWAYS BRASS DISK SEC. COR. 3+2.10, 11.165 R.W. DOWN (S) FROM SOUTHBOUND 1-215. DIRT SHOULDER, 40 FEET WEST OF EDGE OF PAVEMENT, 25 FEET EAST OF WESTERLY RIGHT CENTERLINE, 500 FEET SOUTH OF CALL BOX 215-177 NEAR PROD. OF HOLLAND ROAD.

SURVEY CONTROL: Horizontal control for this survey is based on the California Coordinate System, Zone 6, US Survey Feet, North American Datum of 1983 (NAD83, 2002). Vertical control is the North American Vertical Datum (NAVD88 RCFCD).

HYDROLOGIC SUMMARY

Drainage Area 27.136 Acres

Frequency (Years)	Design Flood	Base Flood
Discharge (Cubic Feet Per Second)	50	100
Water surface (Elevation at Bridge)	6,700	11,700
	1422.39	1424.26

Flood plain data are based upon information available when the plans were prepared and are shown to meet Federal requirements. The accuracy of said information is guaranteed by the State and interested or affected parties should make their own investigation.

EXISTING UTILITY TABLE

UTILITY	OWNER	DISPOSITION
1 Existing 42" Sewer Line	EMWD	Protect
2 Existing 48" Water Line	EMWD	Protect
3 Drainage		

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER & PHASE: ORND000301
PROJECT NO.: OR-1621
FILE # 158-0647R-47(01).dgn

BRIDGE NO.: 56-0647R
POST MILE: 18.53

SALT CREEK BRIDGE (WIDEN) FOUNDATION PLAN

DESIGNER: M. HORNO
PROJECT ENGINEER: M. HORNO

DATE: 11/17/2017

Enclosure 1: NATIONWIDE PERMIT (NWP) NUMBER(S) 14 Linear Transportation Projects. TERMS AND CONDITIONS

1. Nationwide Permit(s) (NWP) No. 14 Linear Transportation Projects. Terms:

Your activity is authorized under Nationwide Permit (NWP) Number(s) 14 Linear Transportation Projects, subject to the following terms:

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars. Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10 acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404) Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

2. Nationwide Permit General Conditions: The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. **1. Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.
(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of

the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.
3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.
16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.
(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.
(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the

project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWP.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.noaa.gov/fisheries.html> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity.
20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.
- (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.
- (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on,

determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.
- (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.
- (b) For NWP 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.
23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:
- (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).
- (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.
- (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.
- (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.
- (2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.
- (3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.
26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.
27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.
28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:
- “When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”
- _____
- (Transferee)
- _____
- (Date)
30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required

compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(1)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer.

However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300

linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

3. Regional Conditions for the Los Angeles District:

In accordance with General Condition Number 27, "Regional and Case-by-Case Conditions," the following Regional Conditions, as added by the Division Engineer, must be met in order for an authorization by any Nationwide to be valid:

1. For all activities in waters of the U.S. that are suitable habitat for federally listed fish species, the permittee shall design all road crossings to ensure that the passage and/or spawning of fish is not hindered. In these areas, the permittee shall employ bridge designs that span the stream or river, including pier- or pile-supported spans, or designs that use a bottomless arch culvert with a natural stream bed, unless determined to be impracticable by the Corps.
2. Nationwide Permits (NWP) 3, 7, 12-15, 17-19, 21, 23, 25, 29, 35, 36, or 39-46, 48-52 cannot be used to authorize structures, work, and/or the discharge of dredged or fill material that would result in the "loss" of wetlands, mudflats, vegetated shallows or riffle and pool complexes as defined at 40 CFR Part 230.40-45. The definition of "loss" for this regional condition is the same as the definition of "loss of waters of the United States" used for the Nationwide Permit Program. Furthermore, this regional condition applies only within the State of Arizona and within the Mojave and Sonoran (Colorado) desert

regions of California. The desert regions in California are limited to four USGS Hydrologic Unit Code (HUC) accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave-181001, and Salton Sea-181002).

3. When a pre-construction notification (PCN) is required, the appropriate U.S. Army Corps of Engineers (Corps) District shall be notified in accordance with General Condition 31 using either the South Pacific Division PCN Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. The PCN Checklist and application form are available at: <http://www.spl.usace.army.mil/regulatory>. In addition, the PCN shall include:
 - a. A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;
 - b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings for projects located within the boundaries of the Los Angeles District shall comply with the most current version of the *Map and Drawing Standards for the Los Angeles District Regulatory Division* (available on the Los Angeles District Regulatory Division website at: www.spl.usace.army.mil/regulatory/); and
 - c. Numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the project site, and all waters proposed to be avoided on and immediately adjacent to the project site. The compass angle and position of each photograph shall be documented on the plan-view drawing required in subpart b of this regional condition.
4. Submission of a PCN pursuant to General Condition 31 and Regional Condition 3 shall be required for all regulated activities in the following locations:
 - a. All perennial waterbodies and special aquatic sites within the State of Arizona and within the Mojave and Sonoran (Colorado) desert regions of California, excluding the Colorado River in Arizona from Davis Dam to River Mile 261 (northern boundary of the Fort Mojave Indian Tribe Reservation). The desert region in California is limited to four USGS HUC accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave-181001, and Salton Sea-181002).
 - b. All areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007 (72 FR 11092)), in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. Examples of EFH habitat assessments can be found at: <http://www.swr.noaa.gov/efh.htm>.
 - c. All watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south.
 - d. The Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the main-stem of the Santa Clara River.

5. Individual Permits shall be required for all discharges of fill material in jurisdictional vernal pools, with the exception that discharges for the purpose of restoration, enhancement, management or scientific study of vernal pools may be authorized under NWP 5, 6, and 27 with the submission of a PCN in accordance with General Condition 31 and Regional Condition 3.
6. Individual Permits shall be required in Murrieta Creek and Temecula Creek watersheds in Riverside County for new permanent fills in perennial and intermittent watercourses otherwise authorized under NWP 29, 39, 42 and 43, and in ephemeral watercourses for these NWP 14 for projects that impact greater than 0.1 acre of waters of the United States. In addition, when NWP 14 is used in conjunction with residential, commercial, or industrial developments the 0.1 acre limit would also apply.
7. Individual Permits (Standard Individual Permit or 404 Letter of Permission) shall be required in San Luis Obispo Creek and Santa Rosa Creek in San Luis Obispo County for bank stabilization projects, and in Gaviota Creek, Mission Creek and Carpinteria Creek in Santa Barbara County for bank stabilization projects and grade control structures.
8. In conjunction with the Los Angeles District's Special Area Management Plans (SAMPs) for the San Diego Creek Watershed and San Juan Creek/Western San Mateo Creek Watersheds in Orange County, California, the Corps' Division Engineer, through his discretionary authority has revoked the use of the following 26 selected NWP within these SAMP watersheds: 03, 07, 12, 13, 14, 16, 17, 18, 19, 21, 25, 27, 29, 31, 33, 39, 40, 41, 42, 43, 44, 46, 49, and 50. Consequently, these NWP are no longer available in those watersheds to authorize impacts to waters of the United States from discharges of dredged or fill material under the Corps' Clean Water Act section 404 authority.
9. Any requests to waive the 300 linear foot limitation for intermittent and ephemeral streams for NWP 29, 39, 40 and 42, 43, 44, 51 and 52 or to waive the 500 linear foot limitation along the bank for NWP 13, must include the following:
 - a. A narrative description of the stream. This should include known information on: volume and duration of flow; the approximate length, width, and depth of the waterbody and characters observed associated with an Ordinary High Water Mark (e.g. bed and bank, wrack line, or scour marks); a description of the adjacent vegetation community and a statement regarding the wetland status of the associated vegetation community (i.e. wetland, non-wetland); surrounding land use; water quality; issues related to cumulative impacts in the watershed, and; any other relevant information.
 - b. An analysis of the proposed impacts to the waterbody in accordance with General Condition 31 and Regional Condition 3;
 - c. Measures taken to avoid and minimize losses, including other methods of constructing the proposed project; and
 - d. A compensatory mitigation plan describing how the unavoidable losses are proposed to be compensated, in accordance with 33 CFR Part 332.
10. The permittee shall complete the construction of any compensatory mitigation required by special condition(s) of the NWP verification before or concurrent with commencement of construction of the authorized activity, except when specifically determined to be impracticable by the Corps. When mitigation involves use of a mitigation bank or in-lieu fee program, the permittee shall submit proof of payment to the Corps prior to commencement of construction of the authorized activity.

4. Further information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. Limits of this authorization.
 - (a) This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - (b) This permit does not grant any property rights or exclusive privileges.
 - (c) This permit does not authorize any injury to the property or rights of others.
 - (d) This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - (a) Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - (b) Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - (c) Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - (d) Design or construction deficiencies associated with the permitted work.
 - (e) Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - (a) You fail to comply with the terms and conditions of this permit.
 - (b) The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - (c) Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 330.5 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. This letter of verification is valid for a period not to exceed two years unless the nationwide permit is modified, reissued, revoked, or expires before that time.
7. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition H below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
8. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
(909) 481-0167
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director



January 22, 2014

Russell Williams
Riverside County Transportation Department
3525 14th Street
Riverside, CA 92502

Subject: Notification of Lake or Streambed Alteration No. 1600-2012-0210-R6
I-215/Newport Road Interchange Improvement Project

Dear Mr. Russell:

The Department had until January 3, 2014 to submit a draft Lake or Streambed Alteration Agreement (Agreement) to you or inform you that an Agreement is not required. The Department did not meet that date. As a result, by law, you may now complete the project described in your notification without an Agreement.

Please note that pursuant to Fish and Game Code section 1602(a)(4)(D), if you proceed with this project, it must be the same as described and conducted in the same manner as specified in the notification and any modifications to that notification received by the Department in writing prior to January 3, 2014. This includes completing the project within the proposed term and seasonal work period and implementing all avoidance and mitigation measures to protect fish and wildlife resources specified in the notification. If the term proposed in your notification has expired, you will need to re-notify the Department before you may begin your project. Beginning or completing a project that differs in any way from the one described in the notification may constitute a violation of Fish and Game Code section 1602.

You have proposed to impact Salt Creek and two unnamed tributaries to Salt Creek, all tributary to Canyon Lake and Lake Elsinore, both east and west of Interstate 215, extending approximately 3,645 linear feet north, and 3,470 linear feet south of the intersection with Newport Road, in the City of Menifee, County of Riverside, State of California; Latitude 33.684949N Longitude -117.171616W. Your project includes the reconstruction of the existing diamond interchange at I-215 and Newport Road as a partial cloverleaf interchange configuration. Newport Road would be widened through the interchange from four through lanes to six through lanes between Antelope Road and Haun Road. Loop entrance ramps will be added with associated right turn lanes on Newport Road. Acceleration lanes would be added to the northbound and southbound entrance ramps and a deceleration lane would be constructed at the approach to the northbound exit ramp. The project requires widening of the Newport Road overcrossing and the northbound I-215 bridge over Salt Creek. The project will permanently impact

Conserving California's Wildlife Since 1870

Mr. Russell Williams
January 22, 2014
Page 2 of 2

2.041 acres and temporarily impact 0.594 acre of Department jurisdictional areas including 2.413 acres (1.866 acres permanent and 0.547 acre temporary) of unvegetated or upland-dominant vegetated streambed and 0.222 acre (0.175 acre permanent and 0.047 acre temporary) of mulefat scrub habitat. You have proposed to incorporate several avoidance and minimization measures including, but not limited to, implementation of standard storm water best management practices as developed in a SWPPP, avoidance of stockpiling within stream channels or adjacent banks, and avoidance of work within the breeding season of riparian-associated species. You have proposed to offset Project impacts, including permanent impacts to 2.041 acres and temporary impacts to 0.594 acre of Department jurisdictional areas, through the active restoration of 1.47 acres of riparian habitat at the Wolfskill Driscoll site and 2.787 acres of restoration through the Riverside-Corona Resource Conservation Districts In-Lieu Fee Program. Your proposed Project term is January 1, 2014 through December 31, 2018.

Also note that while you are entitled to complete the project without an Agreement, you are still responsible for complying with other applicable local, state, and federal laws. These include, but are not limited to, the state and federal Endangered Species Acts and Fish and Game Code sections 5650 (water pollution) and 5901 (fish passage).

Finally, if you decide to proceed with your project without an Agreement, you must have a copy of this letter and your notification with all attachments available at all times at the work site. If you have any questions regarding this matter, please contact Kimberly Freeburn-Marquez at (909) 945-3484 or Kim.Freeburn@wildlife.ca.gov

Sincerely,

Jeff Brandt
Senior Environmental Scientist

cc: Greg Hoisington, URS Corporation



EDMUND G. BROWN JR.
GOVERNOR



MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Santa Ana Regional Water Quality Control Board

September 25, 2013

Russell Williams
Riverside County Transportation
Department
3525 14th Street
Riverside, CA 92502

**CLEAN WATER ACT SECTION 401 WATER QUALITY STANDARDS
CERTIFICATION FOR THE I-215 & NEWPORT ROAD INTERCHANGE
IMPROVEMENT PROJECT, COUNTY OF RIVERSIDE, CALIFORNIA (ACOE
REFERENCE NO. SPL201000446_NWP) (SARWQCB PROJECT NO. 332012-36)**

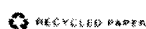
Dear Mr. Williams,

On December 24, 2012, we received an application for Clean Water Act Section 401 Water Quality Standards Certification ("Certification") and the associated filing fee of \$40,252.00 from the Riverside County Transportation Department. The aforementioned submittal was for a project in the City of Menifee, to modify the existing diamond interchange at I-215 and Newport Road, into a partial cloverleaf interchange configuration. Upon receiving further clarifying information in August 2013, this letter responds to your request for certification that the proposed project, described in your application and summarized below, will comply with State water quality standards outlined in the Water Quality Control Plan for the Santa Ana River Basin (1995) (Basin Plan) and subsequent Basin Plan amendments:

Project Description: The Project includes the widening of the Newport Road overcrossing and the northbound I-215 bridge over Salt Creek. Temporary impacts to the bed, channel and bank within jurisdictional Waters of the U.S. include a total of 0.594 acre (1,297 linear feet). Permanent impacts total 2.041 acres (4,593 linear feet). Fill material consisting of 34,000 cubic yards (CY) of earthen fill, 35 CY of reinforced concrete and 310 CY of rock rip rap (totaling 34,345 CY) will be placed within Waters of the U.S. The work will take place within Sections 2, 3, 34, & 35 of Townships 5 & 6 South, Range 3 West, of the U.S. Geological Survey *Romoland* quadrangle map (33.685017° N/ -117.171410° W).

CAROLE H. BESWICK, CHAIR | KURT V. BERCHTOLD, EXECUTIVE OFFICER

3737 Main St., Suite 500, Riverside, CA 92501 | www.waterboards.ca.gov/santaana



Receiving water:
Salt Creek and unnamed ephemeral drainages

Fill area:

Permanent impact to Wetland Habitat	0.003 acre	15 linear feet
Temporary impact to Wetland Habitat	0.036 acre	92 linear feet
Permanent impact to Streambed Habitat	1.986 acres	4,164 linear feet
Temporary impact to Streambed Habitat	0.536 acre	1,170 linear feet

Dredge/Fill volume:

34,000 CY of native materials; 35 CY reinforced concrete, and 310 CY of rock rip rap

Federal permit: U.S. Army Corps of Engineers Nationwide Permit No. 14

You have proposed to mitigate water quality impacts as described in your Certification application. The proposed mitigation is summarized below:

Onsite Water Quality Standards Mitigation Proposed: None

- Standard water quality related best management practices (BMPs) will be employed during construction activities.
- Temporary impacts to non-wetland Waters of the State will include returning temporarily impacted on-site areas to preconstruction contours and hydrological conditions, where feasible.

Offsite Water Quality Standards Mitigation Proposed:

- Compensatory mitigation is proposed through payment into the Santa Ana Watershed Association In-lieu Fee Program. Compensatory mitigation will include enhancement (i.e., removal of invasive riparian vegetation) for permanent impacts at a 3:1 ratio for wetlands¹, and at a 2:1 ratio for non-wetland Waters of the U.S., on Western Riverside County Regional Conservation Authority lands within the Santa Ana River Watershed.
- Temporary impacts to wetlands will be mitigated by removal of riparian invasive vegetation at a 1:1 ratio offsite at the River Ranchos properties located within the San Jacinto Watershed.

¹ The 0.003 acre wetland that is to be impacted is located at the storm water outfall from an adjacent golf course. Flows from this outfall are seasonal in nature, and are predominantly supported by artificial hydrology, i.e., golf course runoff. Highly disturbed by regular vegetation maintenance activities, this wetland is dominated by non-native, invasive vegetation including *Tamarix* sp., and exhibits negligible ecological function or service. If not for its artificial hydrology, this wetland would not exist.

0.49 acre of permanent impact to non-wetland and other waters	mitigated at 2:1	0.982 acre
0.003 acre of permanent impact to seasonal wetland	mitigated at 3:1	0.009 acre
0.454 acre of temporary impact to non-wetland and other waters	mitigated at 1:1	0.454 acre
0.036 acre of temporary impact to seasonal wetland	mitigated at 2:1	0.072 acre

Should the proposed project impact state- or federally-listed endangered species or their habitat, implementation of measures identified in consultation with U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife will ensure those impacts are mitigated to an acceptable level. Appropriate BMPs will be implemented to reduce construction-related impacts to Waters of the State according to the requirements of Order No. R8-2010-0033 (NPDES Permit No. CAS618033), commonly known as the Riverside County Municipal Storm Water Permit, and subsequent iterations thereof. Order No. R8-2010-0033 requires that you substantially comply with the requirements of State Water Resources Control Board's General Permit for Storm Water Discharges Associated with Construction Activity.

Pursuant to California Code of Regulations, Title 14, Chapter 3, Section 15096, as a responsible agency, the Regional Board is required to consider an Environmental Impact Report (EIR) or Negative Declaration (ND) prepared by the lead agency in determining whether to approve a project. A responsible agency has responsibility for mitigating and avoiding only the direct and indirect environmental effects of those parts of the project which it decides to carry out, finance, or approve. Further, the responsible agency must make findings as required by Sections 15091 and, if necessary, 15093, for each and every significant impact of the project.

As required by Section 15096, the Regional Board has considered the mitigated ND prepared for the proposed project and information provided subsequently in the application, in approving this Certification. The Regional Board has independently considered the county's Mitigated Negative Declaration in making this certification and finds that changes or alterations have been required, or incorporated into the proposed project, which avoid or mitigate impacts to water quality to a less than significant level.

This 401 Certification is contingent upon the execution of the following conditions:

- 1) The applicant must comply with the requirements of the applicable Clean Water Act section 404 permit.
- 2) Proposed mitigation shall be timely implemented. Materials documenting the purchase of necessary mitigation credits shall be provided to this office prior to the discharge of fill to, or the dredging or excavation of material from, waters of the state.
- 3) All materials generated from construction activities associated with this project shall be managed appropriately. This shall include identifying all potential pollution sources within the scope of work of this project, and incorporating all necessary pollution prevention BMPs as they relate to each potential pollution source identified.
- 4) The project proponent shall utilize BMPs during project construction to minimize the controllable discharges of sediment and other wastes to drainage systems or other waters of the state and of the United States.
- 5) Substances resulting from project-related activities that could be harmful to aquatic life, including, but not limited to, petroleum lubricants and fuels, cured and uncured cements, epoxies, paints and other protective coating materials, portland cement concrete or asphalt concrete, and washings and cuttings thereof, shall not be discharged to soils or waters of the state. All waste concrete shall be removed.
- 6) Motorized equipment shall not be maintained or parked within or near any stream crossing, channel or lake margin in such a manner that petroleum products or other pollutants from the equipment may enter these areas under any flow conditions. Vehicles shall not be driven or equipment operated in waters of the state on-site, except as necessary to complete the proposed project. No equipment shall be operated in areas of flowing water.
- 7) This Water Quality Certification is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any the conditions contained in any other permit or approval issued by the State of California or any subdivision thereof may result in the revocation of this Certification and civil or criminal liability.

- 8) Best management practices to stabilize disturbed soils must include the use of native plant species whenever feasible.
- 9) Construction de-watering discharges, including temporary stream diversions necessary for project construction may be regulated under Regional Board Order No. R8-2009-0003, General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality. For more information, please review Order No. R8-2009-0003 at www.waterboards.ca.gov/santaana/
- 10) Applicant shall ensure that all fees associated with this project shall be paid to each respective agency prior to conducting any on-site construction activities.
- 11) Prior to grading, excavation, or discharge of fill or construction materials for the project in waters of the U.S. slated to be impacted by the project, functional assessments of the wetlands and riparian habitats that will be impacted by the project, and of proposed mitigation sites, shall be conducted using the California Rapid Assessment Method, February 2012. Mitigation site assessments shall be conducted in the period between October 1 and December 31, until success criteria are met for consecutive years. This information shall be reported to <http://www.californiawetlands.net/tracker/>

Under California Water Code, Section 1058, and Pursuant to 23 CCR §3860, the following shall be included as conditions of all water quality certification actions:

- (a) Every certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section §13330 of the Water Code and Article 6 (commencing with Section 3867) of this Chapter.
- (b) Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a FERC license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to Subsection §3855(b) of this Chapter and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
- (c) Certification is conditioned upon total payment of any fee required under this Chapter and owed by the applicant.

If the above stated conditions are changed, any of the criteria or conditions as previously described are not met, or new information becomes available that indicates a water quality problem, the Regional Board may require the applicant to submit a report of waste discharge and obtain Waste Discharge Requirements.

September, 25 2013

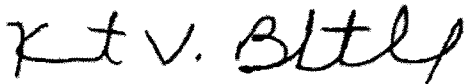
In the event of any violation or threatened violation of the conditions of this certification, the holder of any permit or license subject to this certification shall be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification. Violations of the conditions of this certification may subject the applicant to civil liability pursuant to Water Code section 13350 and/or 13385.

This letter constitutes a Water Quality Standards Certification issued pursuant to Clean Water Act Section 401. I hereby issue an order certifying that any discharge from the referenced project will comply with the applicable provisions of Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ (Order No. 2003-0017-DWQ), "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received Water Quality Certification" which requires compliance with all conditions of this Water Quality Standards Certification. Order No. 2003-0017-DWQ is available at:

www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo_2003-0017.pdf

Should there be any questions, please contact Marc Brown at (951) 321-4584, or Mark Adelson at (951) 782-3234.

Sincerely,



Kurt V. Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board

cc (via electronic mail):

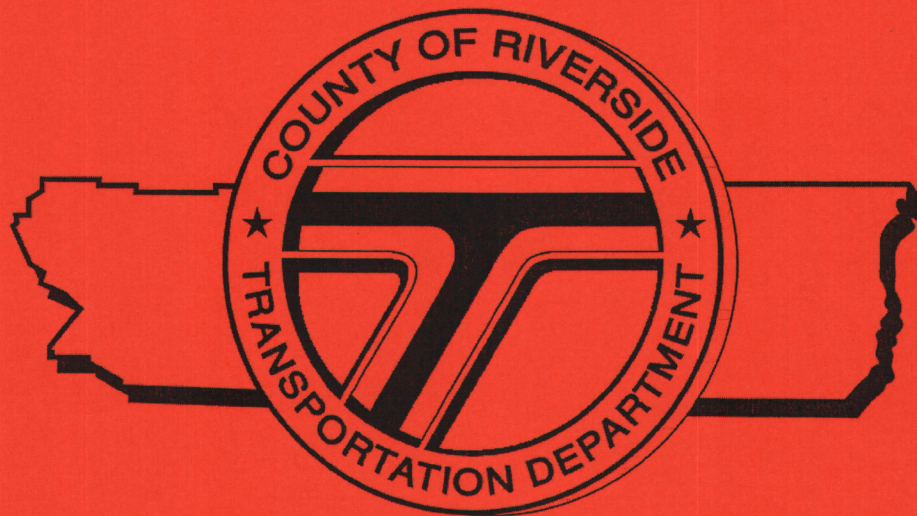
URS Corporation – Greg Hoisington – greg.hoisington@urs.com
U. S. Army Corps of Engineers, Los Angeles Office -Jason Lambert
CA Department of Fish and Wildlife - Daniel Orr-daniel.orr@wildlife.ca.gov
State Water Resources Control Board, Office of Chief Counsel-David Rice
State Water Resources Control Board DWQ -Water Quality Certification Unit
U.S. EPA -Supervisor of the Wetlands Regulatory Office WTR-8

Clerk of the Board

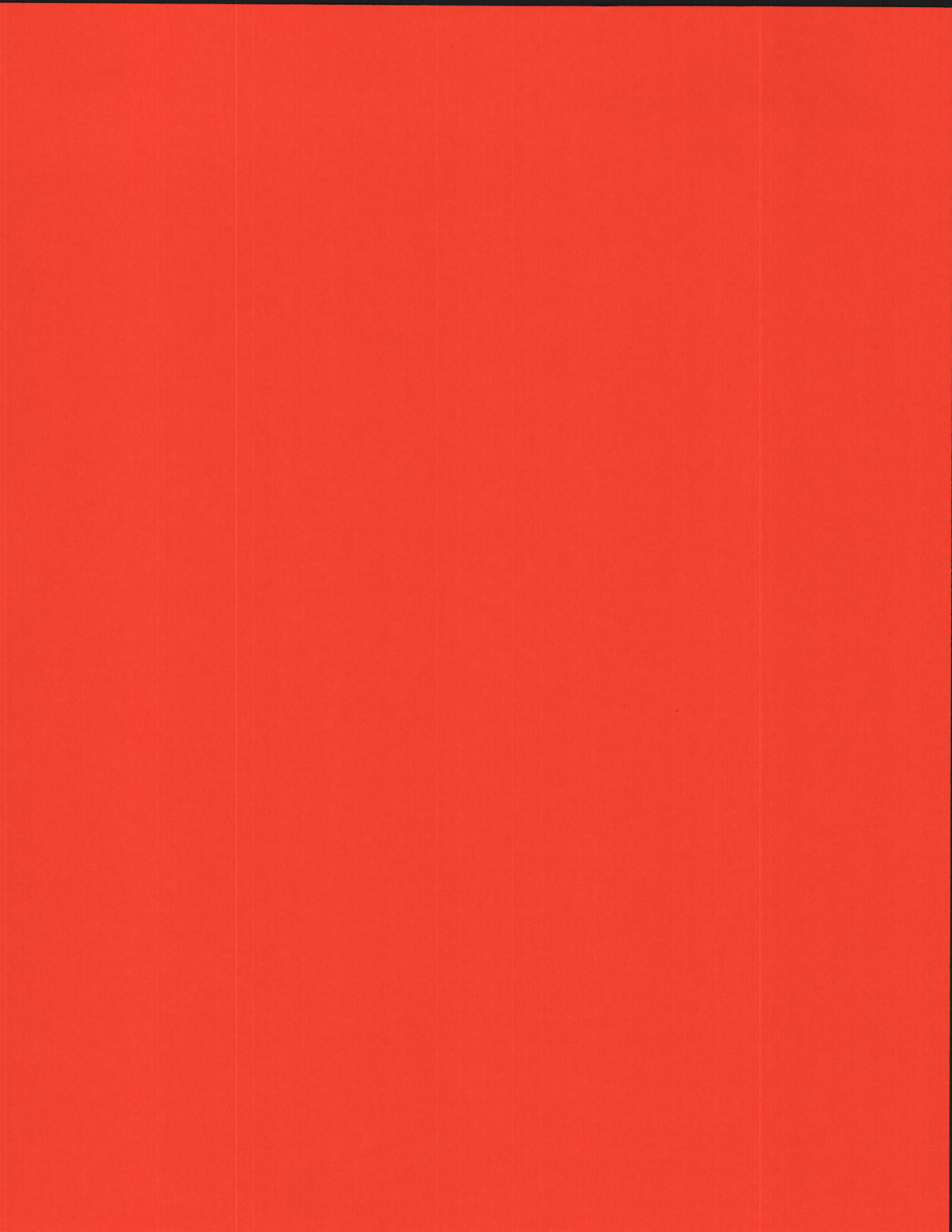
SPECIFICATIONS and CONTRACT DOCUMENTS
for the
CONSTRUCTION
of

Interstate 215 at Newport Road
Interchange Improvements
in the City of Menifee
Project No. B5-0682
Federal Aid No. STPLN- 5956(234)

Book 2 of 2



TRANSPORTATION DEPARTMENT



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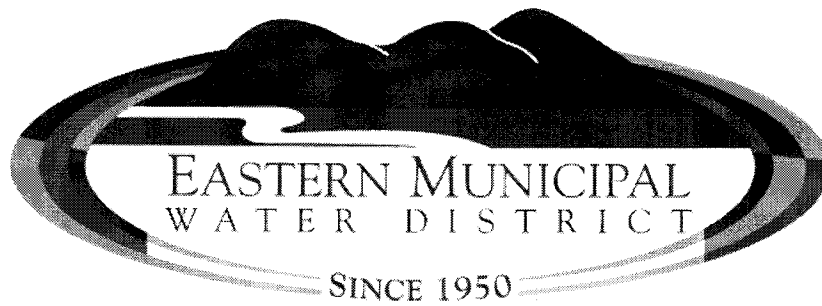
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Riverside County
Perris, California

Newport Road and I-215 Interchange Improvements

Work Order # - 13-160

A PUBLIC WORKS PROJECT

May 10, 2013

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Specifications

Paul D. Jones, II, P.E. - General Manager

***Safety is of paramount and overriding importance to
Eastern Municipal Water District***

Visit our website at www.emwd.org to view currently advertised projects

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EASTERN MUNICIPAL WATER DISTRICT
Newport Road and I-215 Interchange Improvements

SECTION SC - SPECIAL CONDITIONS
SPECIAL PROVISIONS

SC-01. Section F – General Conditions. This project is being bid and administered by the City of San Jacinto. Any reference to the word **DISTRICT** in Section F – General Conditions of these specifications shall mean **City of San Jacinto**. Eastern Municipal Water District **shall not be considered the OWNER** of this project during the bidding and construction phases.

SC-02. Specification Precedence. All the requirements contained within the main bid specification and within City of San Jacinto Standards and Specifications shall supersede all requirements within EMWD Section F, with the exception of language that pertains to EMWD's water and recycled water facilities and appurtenances.

SC-03. Safety. Safety of all activities in connection with the work is of paramount and overriding importance. See Section 01000 - General Safety Requirements for details.

A preconstruction safety conference shall be scheduled prior to the preconstruction conference to review the respective safety requirements and to discuss implementation of all health and safety provisions related to this project. The Contractor and District representatives shall be present.

Please note that the District reserves the right to suspend the work wholly or in part, for any time period as the District representative deems necessary, due to unresolved safety disputes. See Section 01000 - 1.04.

No additional compensation or contract time will be allowed for the period the work is wholly or in part suspended.

Should the contractor continue with the disputed work after having received a written notice of suspension, any work performed by the Contractor during the suspension shall be considered as having been done by the Contractor at the Contractor's own risk as a volunteer, and shall not entitle the Contractor to compensation or any other rights under the contract.

The Contractor shall submit an Injury and Illness Prevention Program and a Project Specific Safety Plan to the District at the pre-construction conference. The Contractor shall not begin work until the above referenced documents have been accepted by the District.

SC-04. Scope of Work . Under these Specifications the Contractor shall furnish and install a xx LF of 20-inch diameter CML&P potable water pipeline through the southerly Newport Road overcrossing bridge. In addition, xx LF of 20-inch diameter CML&C from existing connection with the existing 21-inch diameter water pipeline to the connection to the proposed 20-inch diameter CML&P pipeline. The Contractor shall interconnect the 21-inch diameter to the existing 18-inch pipe through the northerly bridge to maintain potable water service across the bridge and install all fittings, appurtenances, and all other items necessary for the completion of work; and removal, relocation, or abandonment of all existing water pipelines, fittings, and appurtenances as specified in the project drawings. The Contractor shall furnish and install xx LF of 8-inch diameter recycled water line along Newport from Haun Rd. to just East of the Southbound off-ramp, to provide for future irrigation improvements within the interchange for the County. All work shall be performed in accordance with these specifications and the contract drawings..

SC-05. Location of Contract Work Site. The contract work site is located along on the Newport Road Overcrossing, from Haun Road to Antelope Road. just East of Elm Street, in the City of Murrieta. Refer to Index map and location map on the title sheet of the contract drawings or refer to Index map and location map in back of these specifications (APPENDIX B).

SC-06. Construction Water. For work under this specification, the Contractor shall arrange for and pay for construction water. The contractor shall make arrangements for metering its use from Eastern Municipal Water District (EMWD). The contractor shall coordinate with the EMWD inspector for the location of closed EMWD facilities within the project limit for the availability of EMWD water.

Contractor shall provide all necessary piping and appurtenances, including pumps, to convey water to the work site. Arrangements for water from sources other than EMWD shall be the sole responsibility of the Contractor, and no additional compensation will be allowed.

SC-07. Compliance with Storm Water Regulations (NPDES) for Discharge of Storm Water Runoff Associated with Construction Activity. Construction projects under 1 acre do not require coverage under the General Permit or preparation of a Storm Water Pollution Protection Plan (SWPPP), but will require Best Management Practices (BMPs) to control and reduce discharges of pollutants associated with construction into storm drains and receiving waters. The contractor shall prepare, implement and maintain a BMP Plan showing location and type of BMPs to be implemented for the project. The contractor shall alter the plan, implementation and maintenance as necessary for the duration of the project.

SC-08. Preconstruction Conference. The Contractor shall schedule a Preconstruction Conference with Eastern Municipal Water District (EMWD) prior to the start of any work within EMWD facilities. Please contact Michele Burris @ (951) 928-3777 extension 4830 to schedule the preconstruction conference. City of San Jacinto representative, the Contractor and sub-contractor for EMWD facilities construction items to attend.

The following items shall be presented at the preconstruction conference by the Contractor:

- (1) Set of signed, approved EMWD plans for water
- (2) A copy of materials list stating the manufacturer and model number
- (3) Copy of cost breakdown
- (4) Three (3) copies of submittals on pipe used with size and cover letter
- (5) Copy of Recorded Easement, if any is required
- (6) Copy of Contractor's license (A or C-34 only)
- (7) Subcontractors list. *Note:* Each contractor must be licensed according to work performed.
- (8) Construction Schedule with start date, milestones and finish date
- (9) Copy of Annual Trench Shoring/Excavation Permit
- (10) Insurance certificate naming EMWD as additional insured
- (11) Injury and Illness Prevention Program
- (12) EN-84: Specific Operating Safety Procedures (see section 01000)

SC-09. Or Equal Substitutions. Products of manufacturers listed as equals to those specified must be submitted for review and approval by the District not later than the tenth (10th) day preceding the date for receipt of bids.

SC-10. Control Density Fill (CDF). The Contractor will be required to use CDF, in accordance with Section 02252 as backfill in areas under and around existing mainline utilities, and all utility crossings of the proposed underground piping and appurtenances. CDF shall be placed from the bottom of the excavation to the center grade of the utility, and shall extend five feet each side of the existing facility. All costs associated with furnishing and placing CDF shall be included in the respective bid item.

SC-11. Pipeline Dewatering and Disinfection. Contractor shall be responsible for dewatering, dechlorination, and disposal of all water from well and pipeline testing/flushing activities. Discharge of all water must abide by EMWD's

De Minimus permit issued by the Santa Ana Regional Water Quality Control Board (Order No. R8-2009-0003-003, NPDES No. CAG998001, see attached Appendix B), which limits total residual chlorine to a maximum concentration of 0.1 mg/l.

Contractor shall also protect existing water pipelines from contamination during connection procedures. Contractor shall disinfect all new pipelines, pipeline connection closure materials and the existing pipeline at connection points per AWWA Section C-651. All costs associated with connections to existing water pipelines shall be included in the appropriate bid item.

SC-12. Reference to District's Standard Drawings and Detailed Provisions. Any and all referenced Standard Drawings and Detailed Provisions shall be considered part of the contract drawings and specifications. All referenced Standard Drawings and Detailed Provisions of the District are available from the District upon request. The Contractor shall not be entitled to any compensation due to referenced documents not included in the Specifications and Contract Drawings.

SC-13. Water System Shut-Down Time Limitations. The Contractor shall coordinate and schedule with District Inspector the shut-down of the water system two (2) weeks prior to connection. Contractor must dewater existing water system and complete all specified work to existing water pipelines within eight (8) hours of system shut down (by EMWD personnel). Commencement of such work shall be limited to a shut-down start time of no later than 8:00 a.m., Monday through Thursday. Contractor will not be allowed to commence simultaneous construction of other work requiring a separate water system shut-down during the same work day. The Contractor is advised to conduct a single shutdown, if feasible, for all water system work to avoid impacts to customers.

In addition, Contractor shall be subject to a penalty in the amount of \$2,000.00 per hour for every hour the tie-in work exceeds the specified time limitation. Cost for all associated work shall be included in the bid."

Valves are located at the intersection of Newport Road and Haun Road and Newport Road and Antelope Road.

SC-14. Construction Survey and Soils Tests. Upon Contractor's request, RCTMLA will provide construction survey and soil/compaction testing for the project. However, any cost of re-staking or re-compaction due to the Contractor's negligence will be at the Contractor's expense. A 48-hour notice is required for survey and soil services.

SC-15. Locator Wire. Location wire is to be placed over all pipelines to be installed on this project as specified in Detail Provision Section 02718 and Standard Drawing B-656. After all trench backfill operations are complete, the District shall pay for and conduct the locatability test to confirm that the wire is continuous. The Contractor shall be responsible for all costs to confirm, locate and

repair any breaks in the location wire identified in the locatability test. In addition, the Contractor shall reimburse the District for all costs to retest repaired sections of the wire. The Contractor is advised to use care in the installation and backfilling operations to prevent damage to the wire.

SC-16. Existing Underground Utilities and Potholing for Existing Utilities. Unless otherwise indicated on the plans or directly by the utility owner, all utilities shall be protected in place and service maintained as described in Section 02201 Part 1.02 of the Specifications. Utilities crossing the proposed water pipeline alignment are plotted on the plan view of the plans. The utilities were plotted based on information provided from the respective utility owners. The accuracy of plotted utilities is not guaranteed as indicted in Section F-25 of the General Conditions.

Existing utilities have been identified and located on the plans based on the best information available. The Contractor is responsible for performing exploratory excavations (potholing) along the alignment of the project to confirm location of existing utilities and to establish connection requirements to existing pipelines.

All Contractors under contract with EMWD are hereby granted permission to use vacuum excavation on EMWD facilities. Vacuum excavations may not be used on any other facilities unless written permission is obtained from the owner of the facility in accordance with State Law 4216. Any damage to any facilities while vacuum excavation will be at the sole cost of the contractor for repairs to the facilities to the satisfaction of EMWD inspector.

The Contractor shall field survey the elevation and location of utilities, including tie-in points, and provide the information to the District's inspector a minimum of two weeks ahead of construction to permit design revisions should a conflict arise. All associated costs with potholing shall be included in the unit bid price per lineal foot of pipe stated in the Schedule of Values and no additional compensation will be allowed.

SC-17. Provisions for Securing of Trenches. Before making any excavation or trench 5' or more in depth, Contractor shall submit to the District completed Trench Shoring Submittal form EN-57 in accordance with Detailed Provision Section 02201 1.03D.

Trenches in the unpaved street must be backfilled and compacted to 95% relative compaction minimum at the end of each work day in accordance with the jurisdictional agencies encroachment permit. The Contractor shall provide complete unobstructed access to each driveway at all times. Cost associated with securing of trenches shall be included in the bid and no additional compensation will be allowed.

SC-18. Records of Construction. Contractor shall keep and maintain, at the job site, one record set of Construction Drawings as specified in the General Conditions, Section F-Labor and Construction, F-08 "Reports, Records, and Data".

SC-19. Additional Insureds. The Contractor shall include Eastern Municipal Water District (EMWD) as additional insured as part of this contract.

SC-20. Sequence of Construction. The new water pipeline can be disinfected and tested only after all the new water pipelines are installed.

All existing fire hydrants must be kept in service throughout the construction period. Individual fire hydrants can only be taken out of service for a maximum of one (1) working day while the fire hydrant is being connected to the new pipeline. The fire hydrants can be connected to the new pipeline only after the new pipeline has been accepted and is in service.

The contractor will be responsible for disconnecting the existing waterline from the public water system at each end of the project as shown on the contract drawings. The cost of disconnecting the existing waterline shall be included in the bid and no additional compensation will be allowed.

SC-21. Fugitive Dust and Overspray. The Contractor shall comply with all requirements of the South Coast Air Quality Management District (SCAQMD) Rule 403. Contractor is responsible for and shall employ an approved method for dust control monitoring on the job site and shall comply with Part 3.02A, "Dust Abatement" of Section 02201-7, "Construction Method & Earthwork" of these specification.

SC-22. Emergency Vehicles, Businesses and/or Residents Access. Contractor shall provide unobstructed access at all time to businesses and/or resident's driveway within the project limit. The Contractor will be responsible for notifying the businesses and/or residents 72 hours in advance that construction activity will occur in front of their businesses and/or residences and that their driveways will be blocked by these construction activities.

The contractor shall be responsible for providing emergency vehicles access to all businesses and/or residents and around the worksite at all times. The contractor will be required to notify the local fire department and ambulance service and provide them with access routes through the construction area and a schedule indicating when access through any street will be obstructed by construction traffic. Costs associated with providing emergency vehicles, businesses and/or residences access shall be included in the bid and no additional compensation will be allowed therefore.

SC-23. Disposal of Excess Excavated or Removed Material. All excess excavation or removed material shall be the property of the Contractor and shall be removed and disposed away from the project site to an approved disposal area through the County or City. In no instance shall these soils become a public nuisance or threat to public safety.

All cost associated with disposal of excess excavated or removed material shall be included in the bid and no additional compensation will be allowed.

SC-24. Removal and Restoration of Existing Improvements. All existing improvements including, but not limited to, curbs, gutters, cross gutter, spandrels, driveways, sidewalks, walls, fences, sprinklers systems, lawns, shrubs, trees, storm drains, traffic signs and traffic detector loops which are damaged or removed during the course of construction of the project shall be restored or replaced to a condition equal to or better than the existing improvements.

The removal and restoration of existing improvements shall be in accordance with the applicable provisions of these specifications, Standard Specifications, Standard Drawings, Contract Drawings, and the permitting authority's or utility's requirements.

SC-25. Notifications. Contractor shall notify the District, all residents, all commercial and public establishments including of impending works as follows:

1. For the District, Contractor shall notify the District's inspector two working days prior to the start of construction. All work performed without benefit of inspection shall be subject to rejection and removal.
2. Printed notices shall be sent to residences, commercial, and public establishments affected by the work at least one week in advance of construction. Public establishments include but not limited to police stations, fire stations, ambulance services, trash collection services, post office, schools and libraries. Said notices shall first be approved by the District and shall contain a general description of the work, dates work will be performed, descriptions of areas where travel and parking will be restricted, and names of streets which will be closed to through traffic or where traffic will be restricted.

SC-26. Connections. Prior to making connections, Contractor shall excavate and expose all existing utilities and specified connection points to determine exact location (horizontal and vertical) of each. Contractor shall determine the outside diameter, depth, and type of existing pipe at each connection location to the existing system.

SC-27. Protection of Buried Metal Appurtenances. Besides epoxy coated valves or fittings, all metal appurtenances, including restraint fittings, shall be wax taped. The wax-tape coating shall conform to AWWA C217, and shall consist of three parts: surface prime, wax-tape and outer covering:

1. The prime shall be a blend of petrolatum, plasticizer and corrosion inhibitors having a paste like consistency such as Trenton wax-tape prime, or equal.
2. The wax-tape shall be a plastic-fiber felt tape, 50 to 70 mils thick, and saturated with a blend of petrolatum, plasticizer and corrosion inhibitors that is easily formed over irregular surfaces such as Trenton #1 wax-tape, or equal.
3. The outer covering shall be plastic wrapper consisting of three 50 gauge, clear polyvinylidene chloride, high cling membranes wound together as a single sheet such as Trenton poly-ply, or equal.
4. Fusion bonded epoxy coated valves and fittings shall be closely inspected prior to installation. Any scratches or damages shall be recoated to manufacturer's standards or 3-part wax tape system.

In addition to the above, alkalized backfill shall be used within the pipe zone and above/around all steel appurtenances (including restraints), and it shall consist of 50 LBS of hydrated lime per cubic yard of sand.

SC-28. Local Conditions. Contractor shall assess, by personal investigation, local conditions affecting the work. Neither the information contained in this section nor that derived from any maps or plats, or from District employees shall act to relieve the Contractor from any responsibility herein or from fulfilling any and all the terms and requirements of this Contract.

Nuisance water, such as rainfall, irrigation water, or local surface runoff may occur within the construction areas during the period of construction under this contract. The Contractor, by submitting his bid, will be held to have investigated the risks arising from such conditions and shall take all due measures to prevent delays in progress of the work caused by such conditions.

SC-29. Video and Pressure Test Existing 18-inch Pipeline. The Contractor shall professionally video the existing 18-inch domestic water pipeline to verify its integrity. Two copies of the video shall be provided to the Inspector. Once a determination by the Engineer has been made of the integrity of the pipeline, then a pressure test of the existing 18-inch domestic water pipeline will follow. The pressure test shall be conducted at a pressure of 100 psi. Connection

to the existing 18-inch domestic water pipeline shall only occur after a passing pressure test. If the pipeline does not pass the initial pressure test, the Contractor shall repair any leaks per the associated bid item, and shall retest.

SC-30. Construction Sequencing. Construction of the pipelines shall be phased to allow for continuous domestic water service to EMWD customers. The Contractor shall recognize the following restrictions:

Install Lines "A" and "B", from the connection to the existing 18-inch water pipeline on the North Bridge to the resilient seated gate valves on the North side of the tees located at W/L Sta. 20+00 and 31+31, per construction drawings U-11 and U-14

1. Conduct hydrostatic test per EMWD standard specifications prior to connection to existing 18-inch and 21-inch potable water pipelines
2. Connect to existing 18-inch water pipeline. Flush pipeline and fittings to remove solids or contaminated material, chlorinate, conduct final flush and bacteriological testing per EMWD standard specifications prior to connection to existing 21-inch water pipeline.
3. Shut down and dewater existing 21-inch water pipeline.
4. Install the remaining portion of Lines "A" and "B" and connect to existing 21-inch water pipeline. (and cut in tees with valves at stations 518+20 and 522+34.)
5. Re-route flow of water through existing 18-inch water pipeline.
6. Remove existing 21-inch water pipeline through the South Bridge as part of bridge demolition.
7. Construct 8" PVC Recycled waterline between Haun Rd. and bridge overpass.
8. As part of the construction of the South Bridge, install 20" potable waterline through the appropriate bridge cell, and once installed conduct Hydrostatic test, Chlorination, and Bacteriological testing prior to connection to existing water pipeline to the East and West end of bridge.

SC-31. Recycled Water Identification. All buried recycled water pipelines, valves and other appurtenances shall either be colored purple and embossed, integrally stamped/marked "CAUTION: RECYCLED WATER – DO NOT DRINK," or be installed with a purple identification tape, and a purple polyethylene vinyl wrap. All pipe stenciling shall be by pipe manufacturer. In all cases, the pipeline identification must be approved prior to installation.

EASTERN MUNICIPAL WATER DISTRICT

Newport Road and I-215 Interchange Improvements

SECTION P - CONTRACT DRAWINGS

P-01. General. The location of the work, its general nature and extent, the outline of the land owned or controlled by the District and the form and general dimensions of the facilities (i.e. pipelines, appurtenances, etc.) are as shown on the drawings attached and made a part of this Specification as listed below.

P-02. Standard Drawings.

<u>Drawing Number</u>	<u>Drawing Title</u>
A-492	Valve Cap and Riser
A-530	Anchor Block (Vertical Bend Only)
B-255	Installation of Vertical Gate Valves
B-271	Saddle Outlet – 3/4" to 54"
B-286B	Trench Backfill
B-288	Steel Flanges
B-304	Butt Strap Details
B-351	6" X 1 – 2 1/2" Blow Off Installation (Steel Pipe)
B-356	6" X 1 – 2 1/2" & 1 – 4" Fire Hydrant Installation (Steel Pipe)
B-367	2" Air Valve Installation
B-408	Water Pipe Installation
B-563	Steel Pipeline Pipe Pad or Coupling for Cast Iron Fittings
B-638	Steel Cylinder Pipe Field Joint Details Welded, Bonded & Rubber Gaskets
B-645	6"x1-2 1/2"&1-4" Fire Hydrant Installation
B-653	6" X 1 – 4" Blow-Off Installation – Saddle Tangent Outlet – Steel Pipe
B-656	Locator Wire Installation
B-659	Air Test Details
B-660	Test Stations: Insulated Joint and Insulated Joint at Valve
B-661	Thermite Welds Details
B-662	Test Stations: Insulated Joint and Insulated Joint at Valve
B-663	Standard Restraint Tee, Dead End, Bend for PVC C-900 & C-905
B-665	Guard and Marker Posts

B-934	Recessed Trench Plate Detail
PA-1	6" Recycled Water Blow Off
PA-2	Recycled Water Valve Cap & Riser - Detail
PB-1	Metered Service Line – Recycled Water
PB-3	1" Air Valve Cover Assembly – Recycled Water
PB-5	Reclaimed Water Steel Pipeline Installation
PB-6	Pipe Installation for AC, Ductile &PVC Pipe Recycled Water
PB-8	1" Air Valve Installation – Recycled Water
PB-9	2" Air Valve Installation

P-03. Construction Drawings.

<u>Drawing Number</u>	<u>Drawing Title</u>
D-XXXXX	Title Sheet
D-XXXXX	Plan & Profile
D-XXXXX	Plan & Profile
Newport & I-215 Interchange Improvement Plans (Sheets 1-6 Reference Only)	

Revised: 05/28/10

SPECIFICATIONS - DETAILED PROVISIONS
Section 02201 - Construction Methods & Earthwork

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**SECTION 02201
CONSTRUCTION METHODS & EARTHWORK**

PART 1 - GENERAL

1.01 REQUIREMENT

A. Verification of Existing Conditions

It shall be the responsibility of the Contractor to examine the site of the work and to make all investigation necessary, both surface and sub-surface, to determine the character of materials to be encountered and all other existing conditions affecting the work.

B. Site Grading

The entire site within the area affected by construction shall be cleared and bladed. All surfaces to receive compacted fill shall be cleared of existing vegetation, debris, or other unsuitable material. Surfaces shall be cut or filled to the extent indicated by finish grade stakes set by the Engineer. Finish surfaces shall slope uniformly between spot elevations or finish contour lines shown on the drawings and away from structures. Subgrade for finished surfaces, concrete, asphalt, etc., the grading tolerance will be plus or minus .05 feet from surface elevations indicated.

Rough Site Grading. All requirements of Site Grading shall be adhered to, with the exception that in unpaved areas and areas which do not have gradient restraints to allow for proper drainage, the grading tolerance will be plus or minus 0.20 feet from surface elevations indicated.

Rough site grading in areas of future pavement shall have grading tolerance of plus or minus 0.10 feet from surface elevations.

C. Lines, Grades and Measures

All lines and grades will be established by the Engineer, and the Contractor shall provide him with such assistance and materials as may be required. The Contractor shall carefully preserve all survey stakes and reference points. SHOULD ANY STAKES OR POINTS BE REMOVED OR DESTROYED BY ANY ACT OF THE CONTRACTOR OR HIS EMPLOYEES THEY MAY BE RESET AT THE CONTRACTOR'S EXPENSE.

All work shall conform to lines, elevations and grades shown on the construction plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variations shall be reported to the District Engineer or Inspector. In the absence of such report, the contractor shall be responsible for any error in the grade of the finished work.

Construction Methods & Earthwork
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Stakes for video taping of project alignment will be provided by the District at 300' intervals and angle points.

Grade stakes for buildings, sidewalks, pump bases, engine bases, utility services and paving shall be furnished by the Contractor.

Grade stakes for water system construction will be at 100' stations except as directed by the Engineer for specific applications, and at fire hydrant, blow-off, air valve, water meter locations, and valves.

Grade stakes for sewer system construction will be furnished at 25' stations and at locations of appurtenances.

D. Compliance with Regulations

The Contractor shall familiarize himself, and comply with all applicable federal, state, county and municipal rules and regulations pertaining to sanitation, fire protection, and safety.

E. Contractor's Equipment

The Contractor shall provide such modern plant and equipment as may be necessary in the opinion of the Engineer to perform in a satisfactory and acceptable manner, and in accordance with the specifications, all the work required of the Contractor.

F. Representatives for Emergencies

The Contractor shall file with the District a written list giving the names, addresses, and telephone numbers of at least two (2) of his representatives who can be contacted at any time in case of emergency. The representatives shall be fully authorized and equipped to correct unsafe or inconvenient conditions on short notice. The Contractor shall promptly notify the District of all changes in the listing.

G. Power and Water Supply

The Contractor shall provide at his own expense all necessary power required for his operations under the contract. The Contractor shall provide and maintain in good order such modern power equipment as shall be adequate in the opinion of the Engineer to perform in a safe and satisfactory manner the work required by the contract.

The Contractor may obtain water for work under this specification from the sources as stated in the Special Provisions and Requirements of this specification.

1.02 STRUCTURE PROTECTION

A. Contract Drawings

The drawings identify the various pipes, conduits, and other existing utility structures as they are supposed to exist in construction areas, but no error or omission on said drawings shall be construed to relieve the Contractor from the responsibility of protecting any such pipe, conduit, or other existing utility structures.

When deemed necessary by the Engineer, revisions of the contract drawings and additional detailed drawings will be issued to the Contractor during the progress of the work.

B. Notification of Underground Service Alert of Southern California

When performing underground work, the Contractor shall call Underground Service Alert (USA), the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.

C. Operation of Utilities

No District valves or appurtenances of other utility facilities shall be operated by the Contractor without approval and/or instruction from the District or the utility, as appropriate.

D. Maintenance of Utilities

Insofar as practical during the progress of the work, the property of any owner of a public utility pipeline or conduit, sewer, culvert, storm drain, drainage ditch, flood control channel, overhead wires or cables, or underground wires or cables, or any other structure or facility shall not be disturbed but shall be supported and protected against injury and maintained in good operating condition at the expense of the Contractor. In no case shall any such property be disturbed or removed without the consent of the owner and approval of the Engineer. The Contractor shall be responsible for making good all damage due to his operations and the provisions of this section shall not be abated even in the event such damage occurs after backfilling, or is not discovered until after completion of backfilling.

The Contractor shall explore the location and depth of underground facilities, sewers, and storm drains sufficiently in advance of pipe laying or other construction operations so that changes in line or grade, or both, can be made in the pipeline without delay of the Contractor's construction schedule, without relaying or reconstructing previously installed pipe or other facilities and to avoid wherever possible moving, altering, or reconstruction of the obstructing underground facilities, sewers, or storm drains.

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The locations of existing underground utilities and structures, insofar as they are known from information furnished by the respective utility companies and agencies and other sources, have been shown on the drawings.

It shall be the responsibility of the Contractor to verify the location of these obstructions and to locate any other underground utilities and structures which might necessitate a change in the line and grade of the new work. If the Contractor, while performing the work of construction, discovers utility facilities not identified by the District in contract plans or specifications, he shall immediately notify the District in writing.

In no case shall any utility that has been damaged, whether shown or not shown on the plans, be backfilled without the Contractor notifying the utility company of the damage.

Pursuant to Section 4215 of the Government Code, the District shall compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating main or trunkline utility facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. The Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the District or the owner of the utility to provide for said removal or relocation of such utility facilities. Nothing herein shall be deemed to require the District to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction.

E. Utility Construction

If the work requires, as shown on the drawings or as specified, or as required for the Contractor's convenience, that the surface and overhead facilities, underground facilities, sewers and storm drains should be moved, altered, relocated, reconstructed, or temporarily supported, in order that the facilities included in the contract can be constructed, the Contractor shall make all arrangements therefore with the respective owners and shall bear all expenses for moving, altering, relocating, or temporarily supporting the facilities.

In addition, the District may require the moving, altering, or reconstructing of obstructing underground facilities, sewers, or storm drains, and compensation therefore will come under extra work where such work is ordered in writing by the Engineer.

Pipelines determined to be abandoned may be destroyed if conflicting with the contract work and properly disposed of. Exposed ends of abandoned pipelines shall be plugged for watertightness as approved by the Engineer.

1.03 JOB CONDITIONS

A. Rights-of-Way

The District will provide right-of-way for the pipelines to be constructed under the contract. Neither the terms hereof nor anything shown on the drawings in connection with the right-of-way provided by the District shall be construed to entitle the Contractor to conduct operations in said right-of-way in violation of any public agency ordinance or regulation restricting interference with water courses and drainage channels, road, alley, or street, until he has obtained permits therefore from the proper authorities.

In all of the streets in which his work may interfere with ingress or egress of the occupants of the abutting property or of their vehicles, the Contractor shall maintain temporary practical means of ingress and egress or shall make satisfactory arrangements with the occupants for the obstructing of ways to their properties for the duration of the interference. Such arrangements shall be made in writing and a copy submitted to the Engineer.

Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street or way during performance of the contract work, and he shall so conduct his operations as not to interfere unnecessarily with the authorized work of other agencies in such streets and ways.

Fences on the right-of-way shall be removed by the Contractor where necessary for the performance of the work, but, where required, shall be maintained until the work is completed or their removal is authorized. Where the Contractor removes existing fences to facilitate the work, temporary fence protection for lands adjacent to the right-of-way shall be provided at all times during the continuation of the contract. Such temporary fence protection shall be adequate to prevent livestock from straying from or onto adjacent lands and shall be constructed complete with gates and/or cattle guards. The cost of all work described in this paragraph shall be included in the prices bid for other items of work and no separate payment shall be made therefore. Where pipelines are to be constructed through and adjacent to tracts of improved property, the Contractor shall, where practical, confine his operations within a 30-foot wide right-of-way or such other width right-of-way as may be designated on the drawings or in the Special Provisions. If the Contractor's operations are such as to require additional space, the Contractor shall arrange for and secure at his own expense any additional right-of-way required. The Contractor shall enter into written agreements with the landowners and copies of the agreements shall be furnished to the Engineer.

Where the pipeline is to be constructed through cultivated fields not in public road rights-of-way, the District will obtain and pay for damage to crops over a total overall width of 30' or such other width as may be designated. Any damage to crops outside of the designated right-of-way shall be paid for by the Contractor.

B. Safeguarding Excavations and Property

Excavations shall be adequately shored and braced so that the earth will not slide or settle and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from a lack of adequate shoring and bracing shall be the responsibility of the Contractor. The Contractor shall effect all necessary repairs or reconstructions at the Contractor's own expense as directed by the Engineer and shall bear all other expenses resulting from such damage.

C. Safety Measures

Each bid proposal submitted under these specifications for the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, or the use of such a trench or open excavation, shall include in appropriate bid items for such work the costs necessary to provide adequate sheeting, shoring, and bracing, or equivalent method for the protection of life or limb, which shall conform to applicable safety orders, including the Construction Safety Orders of the California Division of Occupational Safety and Health, in accordance with the requirements of the California Occupational Safety and Health Act.

When working in, or connecting to, existing systems in operation, the required safety provisions for work in an operating system will be enforced, including provisions for working in confined air spaces when appropriate.

Nothing in this requirement shall be construed to impose tort liability on the awarding body or any of its employees.

D. Trench Shoring Approval

Any contract for public works involving an estimated expenditure in excess of twenty-five thousand dollars (\$25,000) for the excavation of any trench or trenches 5' or more in depth, shall require submission by the Contractor and acceptance by the awarding body or by a registered civil or structural engineer to whom authority to accept has been delegated, in advance of excavation, of a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

Nothing in this section shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

Nothing in this section shall be construed to impose tort liability on the awarding body or any of its employees.

E. Trench Permit

Prior to commencing any work in the construction or use of trenches or excavations which are 5' or deeper and into which a person will be required to descend, the Contractor shall apply to the California Division of Occupational Safety and Health, and secure a permit therefore, and shall furnish the District with a copy thereof prior to commencing any excavation.

F. Safety Officer

The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of hazards and accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor to the District.

G. Right to Occupy Completed Portions of Work

The District may wish to occupy or place in service portions of the completed work before final completion of the contract work and shall be at liberty to do so, but such occupancy or placing in service of any completed portion of the work shall not void the contract nor relieve the Contractor of his responsibility of protection and care of all work until final completion and acceptance of the entire work, provided, however, that expense directly attributable to operation and placing in service the portions of the work shall not be chargeable to the Contractor.

1.04 GUARANTEE

The Contractor hereby guarantees that the entire work constructed by him under the contract will fully meet all the requirements thereof as to quality of workmanship, and of materials furnished by him. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defective materials or workmanship supplied by him which have become evident within one (1) year, or other guarantee period elsewhere specified, after date of notice of completion and acceptance of the work is filed, and to restore to full compliance with the requirements of these specifications including the test requirements, any part of the facilities or appurtenant works which during said guarantee period is found to be deficient with respect to any provision of this specification. Replacement of backfill where it has settled below the lines established by the Engineer shall be considered part of such repair work. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Engineer. If the Contractor fails to make the repair and replacements promptly, the District may do the work, and the Contractor and his surety shall be liable to the District for the cost thereof.

PART 2 - PRODUCTS

2.01 MATERIALS

A. **Select Backfill Material, and Special Bedding and Backfill**

Select backfill material shall be selected from the excavated material or imported when not available from the excavated material. In either case, it shall be provided at the Contractor's expense, and shall be included in the costs proposed for pipeline installation on the bidding sheets.

Where called for on the plans or in these specifications, and not covered by a separate bid item, special bedding or backfill shall be included in pipeline construction costs on the bidding sheets.

Where required by the governing agency or by the District to meet compaction requirements of these specifications or requirements of these specifications for bedding or for select granular backfill, special bedding or imported backfill and disposal of excavated spoil shall be provided at the Contractor's expense.

The requirements for special bedding and backfill at the Contractor's expense as described herein as a part of the Special Conditions or as shown on the Contract Drawings shall supersede and take precedence over any and all other requirements for measurement and/or payment for special bedding or backfill found elsewhere in these specifications. Bedding is defined herein to include sand, rock or concrete base, cradle, or encasement. Backfill material is defined herein to include backfill for both trench backfill and pipe bedding (or pipe zone backfill).

Special bedding or backfill not called for on the plans or in these specifications, but required by the Engineer over and above the requirements of this specification shall be constructed at additional cost, at prices reflecting current material costs as evidenced by paid vouchers, plus 50% to cover all costs of installation and overhead.

The encounter of ground water not anticipated in engineering reports made available for this contract, and the required over-excavation and construction of a stable base as determined necessary by the Engineer shall be considered over and above the requirements of this specification, and the required base shall be paid for at the above stipulated prices.

PART 3 – EXECUTION

3.01 WEATHER LIMITATIONS

Excavating and grading shall be performed only when the weather conditions do not adversely affect the quality of the finished product. Any graded or excavated areas that are damaged by the effect of rain, or other weather conditions, during any phase of the construction, shall be re-excavated, regraded, and recompact to conform to the herein specified requirements, without additional cost to the District.

3.02 PREPARATION

A. Dust Abatement

The Contractor shall furnish all labor, equipment and means required and shall carry out protective measures wherever and as often as necessary in the opinion of the Engineer to prevent his operations from producing dust in amounts damaging to property or causing nuisance. The Contractor shall be responsible for any damage resulting from dust originating from his operations. **The Contractor shall also make himself knowledgeable of Southern California Air Quality Management District's Rule 403-Fugitive Dust and comply with these requirements.** The dust abatement measures shall be continued until all required resurfacing is completed or until the Contractor has completed arrangements with the proper authorities whereby he is relieved of further responsibility. Such arrangements shall be approved by the Engineer prior to their completion. All compensation to be received for dust abatement shall be included in the prices named for appropriate items of the bidding sheet.

B. Utilities and Substructures

The indication of the type and approximate location of existing utilities and substructures in the Contract Documents represents a diligent search of known records, but the accuracy and completeness of such indications are not warranted by the District and utility structures and services not so indicated may exist. Before commencing any excavations, the Contractor shall investigate, determine the actual locations, and protect the indicated utilities and structures, shall determine the existence, position, and ownership of other utilities and substructures in the site or where the work is to be performed by communication with such owners, search of records, or otherwise, and shall protect all such utilities and substructures.

C. Control of Water

The Contractor shall acquire such permits and take such measures as may be required, and shall furnish, install, and operate such pumps or other devices as may be necessary to remove any seepage, storm water, or sewage that may be found or may accumulate in the excavations during the progress of the work. The Contractor shall keep all excavations entirely free from water at all times during the construction of the work and until the Engineer gives permission to cease pumping. He shall keep the complete work reasonably free from accumulations of water and sewage, and shall free it entirely at such times as may be required by the Engineer for inspection or other purposes. Any accumulated water or sewage thus pumped shall be disposed of in accordance with good practice and local ordinances.

The Contractor shall provide an adequate dewatering system for the control of surface and groundwater seepage into the excavations as may be required during the construction period. The proposed plan of this dewatering system shall be submitted to the Engineer for concept approval prior to the installation of the system.

3.03 CONSTRUCTION

A. Excavation

The Contractor shall perform all excavation necessary or required for the construction of the facilities covered by these specifications. Excavations may be performed by either hand or machine methods and shall be of sufficient size to provide adequate space for working in accordance with safety regulations and practice and the Contract Drawings. Excavations shall include the removal and disposal of all materials of whatever nature and quantity including water, rock, decomposed granite, or any other type of soil or material, subsurface obstructions and also overhead obstructions which may interfere with the operation of equipment used on the work, for no additional compensation. Excavation shall immediately precede subsequent construction, and shall not remain open longer than necessary for construction. Excavation for foundations shall be made only after construction of subgrade, as hereinafter described, has been completed. Over-excavation for foundations shall be filled with concrete.

1. Seismic Investigation. In suspected or known fault areas, Contractor shall make his trench or excavation available to the property owner or his geologist for seismic investigations as required under the Alquist-Priolo Geologic Hazard Zones Act. Such investigation shall involve no delay to the Contractor.

2. Trench Excavation. Unless otherwise specified in the Special Conditions or on the Contract Drawings, pipeline trenches shall have a minimum clear distance: pipe sizes up through 12" - 6" to 9" min., sizes larger than 12", 12" minimum on each side of the pipe barrel when the pipe is properly placed and aligned in conformity with the Contract Drawings. The sides of the trench shall be parallel to and at equal distance on each side of the centerline of the pipe.

The maximum length of trench which shall be opened or partially opened at any one time shall be limited to 500' for sewer lines and one-half mile for water pipelines, except where governed by other agencies or approved by the Engineer. See Section 3.04. J, "Clean-up During Construction" for maximum trench length without restoration. Bell holes or depressions shall be dug by hand at the proper locations of sufficient size to adequately work the joints, but no larger than is required.

When the trench is excavated to the line and grade as shown on the drawings, and the bedding material encountered is rock, the trench shall be excavated an additional depth of at least 4" below the grade for the bottom of the pipe, and the bottom of the trench shall be refilled with approved material, moistened and compacted by tamping or by other approved method to the satisfaction of the Engineer.

Where ground water is encountered and the native material does not afford a solid foundation for pipe subgrade as specified above, the Contractor shall excavate to such depth below subgrade as determined necessary by the Engineer and shall construct a stable base by placing crushed rock bedding upon which subgrade can be prepared. Crushed rock for bedding shall be one and one-half inch (1 1/2") maximum size.

When the trench has been inadvertently excavated below the designed grade, at the Contractor's expense, the bottom of the trench shall be refilled with approved material, well compacted into place in an approved manner and to the satisfaction of the Engineer.

3. New Subdivision Construction. Where pipelines are to be constructed in new subdivision developments, it is anticipated, unless otherwise stated, that sewers will be installed after grading is completed to subgrade in streets and proposed paved areas, and to final grade in other areas; then curbs will be constructed prior to water system construction. Only after water system construction will other utilities, roadway base, and paving be placed.

4. Excavated Materials. Shall be piled neatly along the side of the trench and adjacent to manhole excavations in such a manner as to be of as little inconvenience as possible to the public traffic or the occupants of the adjacent property, and be in compliance with safety standards and soils report recommendations.

Through all cultivated areas, topsoil removed from excavations shall be replaced as backfill in the uppermost part of the excavation to a depth as it existed previous to excavation, not exceeding 18". Where topsoil replacement is required, excavated topsoil shall be stored separately from other materials and in general shall be replaced as backfill in the same parcel of land from which it came.

5. Manhole Excavations. Shall be made to the depths as indicated on the drawings, with sufficient side clearances to provide adequate working space for the construction of the manhole structure.

When unsatisfactory soil bearing conditions, such as soft mud, quicksand, or other unstable materials are encountered at the elevation of the bottom of the manhole, the base shall be made firm and solid by removing said unstable material to sufficient depth and replacing same with crushed rock, gravel, or other approved material, well compacted into place in a manner approved by the Engineer.

6. Blasting. The use of explosives on the work shall be subject to the approval of the Engineer. All operations involving the handling and storage and use of explosives shall be conducted with every precaution prescribed by the Construction Safety Orders of the Division of Occupational Safety and Health of the State of California and by local laws and regulations. Only competent, reliable men working under experienced supervision shall be permitted to use explosives. The Contractor will be held responsible for and shall make good any damage caused by blasting or otherwise resulting from disposition or use of explosives on the work.
7. Cutting. In cutting or breaking up street surfacing, the Contractor shall use equipment acceptable to the authorities concerned. The pavement to remain in place shall be trimmed with an approved cutting device in such manner as to leave a vertical face with sound, unfractured pavement. All pieces of pavement resulting from cutting or breaking up street surfacing shall be removed from the trench area prior to trenching.

8. Disposal of Excavated Materials. Insofar as space is available in the right-of-way, such space may be used for temporary storage of excavated material, to be used for backfill, provided that no material shall be stored or deposited in violation of any ordinance or regulation prohibiting the filling or obstructing of water courses in drainage channels. Storage of excavated material in any street or highway shall conform to the regulations of the public authority having jurisdiction there over. All materials removed from the excavations in excess of that stored temporarily as above specified shall be immediately hauled away and used in backfilling elsewhere, or, if not used, shall be disposed of by the Contractor. The disposal area shall be acquired by the Contractor. No materials shall be disposed of either temporarily or permanently on privately or publicly owned property unless the Contractor shall first obtain permission therefore from the owner or agency concerned. The Contractor shall furnish satisfactory evidence to the Engineer that such consent has been obtained and shall be responsible for all damages and claims that may arise in connection therewith.
9. Bracing and Shoring. The Contractor shall furnish, place and maintain such bracing and shoring as may be required to support the side of the excavations for the proper protection of workmen, to facilitate the work and prevent damage to the pipes and manholes being constructed, and to prevent damage to adjacent structures or facilities. Upon completion of the work, all bracing and shoring shall be removed unless otherwise directed or permitted by the Engineer. Site conditions that alter shoring submittals such as blasting, groundwater, differing soils, etc., must be reviewed for adequate shoring by Contractor or his Engineer.
10. Bridges. Foot bridges of approved construction, not less than 4' in width, and provided with hand rails and uprights of dressed lumber, shall be installed over the trenches at all crosswalk intersections and at such other points where, in the opinion of the Engineer, traffic conditions make it advisable. Substantially constructed bridges, adequate for handling all vehicular traffic, shall be installed over any trench or other excavation in a street intersection whenever such excavation is in excess of half the width of the street crossing. Adequate bridges shall be provided to make possible the safe and full use of all driveways or roadways used to move vehicles from the public street onto private property.

All bridges required to be installed shall be maintained in place as long as the condition of the work requires their use for the safety or convenience of the public, except that when necessary for the proper prosecution of the work in the immediate vicinity of a bridge, said bridge shall be relocated to take care of the traffic requirements, or may be temporarily removed for such period or periods of time, at the Contractor's risk, as the Engineer may approve.

B. Installation

1. Pipe. The pipe manufacturer shall send a field representative to answer any questions on installation procedures, within 48 hours of request, as coordinated by and through the Engineer.
2. Concrete Encasement. Where required on the Contract Drawings, concrete cradles and encasements shall be constructed in accordance with the requirements stated thereon.

Whenever the maximum allowable width of trench as specified elsewhere in these specifications or in the construction plans or the standard drawings, is exceeded for any reason except as provided for in the plans or special conditions or by the written direction of the Engineer, and where the resulting effect of the exceeded trench width would place loads upon the pipeline exceeding the maximum loads recommended by the pipe manufacturer, the Engineer may require, at his discretion, that the Contractor, at his own expense for all labor and materials cradle the pipe in Class "C" concrete, as described in this specification.

C. Fill, Backfill and Grading

Fill, Backfill and Grading shall include all scarifying, moistening, compacting, and other manipulations of the soil necessary to obtain the required densities, cross sections, lines, grades and surface finish indicated or specified. Backfill shall not be placed in trenches or excavations until the pipelines and structures in the particular section involved have been inspected and approved for backfilling by the Engineer.

Backfill shall be placed, insofar as practical, as the work progresses, allowing time for concrete (if used) to attain sufficient strength.

All excavations outside the completed pipelines and structures shall be backfilled with compacted material to the level of the original ground surface unless otherwise shown on the drawings or ordered by the Engineer. The materials used for backfill shall be imported, selected material, or approved selected excavated materials and shall be placed as directed by the Engineer. All materials placed within 6" of the pipe or structure shall be free from rocks or boulders larger than 1 1/2" maximum dimension, and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets in the excavation.

Unsuitable material encountered at the surface upon which the bedding material is to be placed shall be removed to a depth as determined in the field by the Engineer. Unsuitable material shall be as determined by the Engineer. If not otherwise specified, removal of material and additional bedding so ordered over and above the amount required will be paid for in accordance with the specifications unless, however, the necessity for such additional bedding materials has been occasioned by an act or failure to act on the part of the Contractor, in which event the Contractor shall bear the expense of the additional excavation and backfill to the required depth. The Contractor's attention is called "dewatering" procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water in the trench excavation. However, the Contractor has the responsibility to reasonably ascertain the soil conditions prior to bid. The cost of removing the unsuitable materials should have been known prior to bid and be included in the bid price.

Imported materials (if any) required for fill or backfill shall be provided by the Contractor from areas outside the site at his own expense. Such material shall be as herein specified and must be approved by the District before delivery to the site.

1. Structure Backfill. The Contractor shall place all backfill about structures to the original ground level, or to the lines shown on the drawings or prescribed by the Engineer. Fill materials shall be of earth only, and be free from debris, vegetation, alkali, or other deleterious substances.

All backfill about structures shall be placed in layers not more than 6" thick prior to compaction, which shall be obtained by moistening to optimum moisture content prior to placing and compacting to maximum compaction by use of suitable equipment approved by the Engineer.

The Contractor shall take all necessary precautions to protect the structure and underground facilities during the placement, compacting or consolidating, and grading of backfill.

2. Pipeline Backfill. Except as otherwise required by the construction plans or the standard drawings, the material used in backfilling to 1' above the pipe shall be granular material approved by the Engineer and in accordance with the manufacturers requirements, sandy, or sandy gravel material obtained from required excavation or from approved borrow areas, as shown on the Contract Drawings or as directed by the Engineer.

This material shall be carefully placed and compacted to provide a firm continuous bedding and encasement for the pipe. Pipe shall be shaded the same day it is laid to protect it from possible damage and/or thermal expansion. Pipe zone backfill may be consolidated by careful flooding to saturation only if the soil has a Sand Equivalent of 30 or better and no more than 10% fines (particles passing the no. 200 sieve), otherwise mechanical compaction will be required or as specified elsewhere in these specifications.

Variations to the foregoing pipeline backfill requirement, when recommended by the pipe manufacturer or requested by the Contractor, shall be submitted for approval by the District prior to the commencement of such pipe installation. The method of compaction shall then be proven before backfilling more than the footage of pipe allowed by the contract specification. In lieu of a specific contract requirement, not more than 1000' of pipe shall be laid and backfilled prior to proving the method of compaction.

The remaining trench backfill shall consist of select backfill material from the excavation, when available, free from stones or lumps exceeding 3" in greatest dimension, and free from vegetable matter or other unsatisfactory material. This select material as defined herein and elsewhere in these specifications shall be placed in layers not exceeding 2' in depth, unless otherwise directed by the Engineer. Excavated soils that have excessive moisture must be dried, mixed, or replaced with suitable material that will meet the compaction requirements at no additional cost to EMWD. Each lift shall be consolidated in such a manner that the backfill will meet the requirements of these specifications. Care shall be taken not to disturb the backfill previously placed, and the Contractor shall at all times protect the pipe against flotation. Material placed between successful test and failed test shall be tested at one-fifth (1/5) the distance intervals until a passing test is achieved. All material from failed test to successful test shall be removed, recompacted and retested.

3. Sewer Line Backfill. Backfill shall not be placed in trenches or excavations until the sewer lines and manholes in the particular section involved have been inspected and approved for backfilling by the Engineer.

For all sewer pipe, select granular backfill having a Sand Equivalent of 30 and less than 10% fines (particles passing the no. 200 sieve) shall be used up to an elevation 12" above the top of pipe, imported whenever the Engineer determines that native material is not satisfactory. Material for this purpose shall conform to the requirements as set forth herein. The pipe

zone backfill shall be carefully packed under the haunches of the pipe and brought up simultaneously on both sides, to the full specified depth, so as to prevent any displacement of the pipe from its true alignment. In compacting by flooding, no ponding of water above the surface of the sand will be permitted.

4. Water Line Backfill. Prior to backfilling, all pipe 30" in diameter and larger shall be either filled with water under pressure or braced with stulls sufficiently to prevent distortion while placing, consolidating and compacting back fill. Prior to backfilling, all trench supports shall be removed unless otherwise approved by the Engineer.
5. Gravel Fill. Gravel fill shall be placed where specified, indicated on the plans, or designated by the Engineer to meet special conditions encountered.

Where gravel fill is required, crushed rock may be substituted or added. Crushed rock for foundations shall be as defined for pipe bedding which is described elsewhere in this specification.

The percentage composition by weight of gravel fill shall conform to the following grading when determined by Test Method No. Calif. 202:

<u>Sieve Sizes</u>	<u>Percentage Passing Sieves</u>
1"	100
3/4"	85-100
No. 4	35-55
No. 30	10-30
No. 200	2-9

6. Compacting and Surfacing. Except as otherwise specifically required by the encroachment permit or elsewhere in these specifications, the following requirements will apply:

The upper portion of the final lift will be backfilled with selected material from the excavation, moistened to optimum moisture content and compacted by mechanical tamping to meet the requirements of the District standards. All backfill in public roads shall be consolidated and surfacing shall be placed to meet State of California and Riverside County requirements as stated in the respective permit, whether or not required by the inspector for that particular agency - unless otherwise approved by the Engineer.

Where backfill is in areas not within public roads, it shall be consolidated and tested to meet the requirements of these specifications, except as otherwise approved by the Engineer.

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Minimum acceptable field densities specified in District standards shall be determined in accordance with the testing procedures set forth elsewhere in these specifications.

Where sand material of an approved grade is used for backfilling, mechanical compaction may be eliminated and compaction obtained by jetting.

Except as otherwise required by a specific permit, where pavement is being replaced, an approved plant mixed surfacing shall be placed to a minimum thickness of 3" when compacted. Surfacing in streets shall be maintained to original street grade after laying and any settlement filled with plant mix surfacing.

The edges of trenches which are broken down during the making of subgrade shall be removed and trimmed neatly before refilling or resurfacing. When the backfill is complete and excess material removed, the surface will be graded and a layer of approved decomposed granite will be placed with a minimum thickness of 4" when compacted at optimum moisture content by rolling and to a grade to conform to the original roadway section. All pavements outside the paylines damaged by the Contractor shall be trimmed and repaired.

If the edge of the excavated trench when trimmed is within 2' of the edge of the roadway pavement, then the pavement shall be completely removed to the edge of the roadway and replaced with the replacement of the trench pavement. Except as otherwise directed by the Engineer, after a period of not less than 30 days or more than 60 days, any settlement shall be filled with decomposed granite. The top 2½" shall then be road mixed where allowed, with a minimum of 1½ gallons liquid asphalt binder of grade SC3 or 4 (as directed) per square yard and compacted to the original roadway section. Each phase shall be approved by the Engineer before proceeding to the next operation. Where allowed, the road-mixed surfacing operation shall conform to the Standard Specifications of the State of California Department of Transportation.

Pavement, curbs, gutters and walks removed, cut or damaged during the construction of facilities shall be replaced or restored to their original condition, or as otherwise specified. Local ordinances governing such replacement shall be adhered to in all respects.

Removal and/or replacement of pavement where pavement now exists, as well as removal and/or replacement of any other obstructions, will be included in the item cost for the particular installation, unless specifically itemized separately on the bidding sheet.

D. Paving

Where not required otherwise by specific contract requirements or permit requirements incorporated in the contract, the Contractor shall construct new asphalt concrete paving as indicated on the Contract Drawings and as specified herein. All paving proposals and operations shall be subject to the approval of the Engineer.

Where this work is included in a lump sum bid item, it is the Contractor's responsibility to satisfy himself as to the exact lengths and/or dimensions of new roads and pavements. Terminals of all surfacing indicated on the Contract Drawings shall join any existing surfaces in a smooth juncture.

1. Sub-base

- a) Preparation. The upper 12" of sub-base in any area to be paved shall be compacted to not less than 95% of maximum compaction, as determined by currently adopted ASTM D-1557 and procedure C.
- b) Weed Killer. After the sub-base has been prepared, a weed killer shall be applied to the entire sub-base. Weed killer shall be OUST XP as manufactured by DUPONT, or approved equal. The weed killer shall be applied according to the manufacturer's published instructions.

2. Aggregate Base Course. Shall be Class II aggregate base. The aggregate base course shall be the thickness shown on the plans and shall be placed in maximum 4" lifts. Aggregate base course shall be compacted to 95% of maximum compaction, as specified by ASTM D-1557. Aggregate base course shall be furnished, spread and compacted, as specified for Class II Aggregate Base Course in the Standard Specifications, State of California,

Department of Transportation, latest edition. A spreader box will not be required but care shall be taken to prevent segregation during placement.

3. Asphalt Concrete

- a) Asphalt Concrete shall conform to the requirements of Caltrans Standard Specifications Section 39, for Type "B". Aggregate will conform to a grading for 1/2" maximum aggregate with paving grade asphalt PG 64-10 (Section 92) unless otherwise directed by the Engineer.

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- b) Proportioning, Mixing, Spreading and Compacting. The proportioning and mixing of aggregates and asphalt, and the spreading and compacting of the asphalt concrete to make up the asphalt pavement, shall be in accordance with the Standard Specifications, State of California, Department of Transportation, latest edition. The paving machine shall have a self-screening spreader unless approved otherwise by the Engineer.
- c) Tack Coat. Tack coat shall be Type SS1H grade Anionic Asphaltic Emulsion as per Caltrans Standard Specification 94.
- d) Prime Coat. When indicated on the Plans or in the Special Provisions, a prime coat consisting of Grade SC-250 liquid asphalt shall be applied in accordance with Caltrans Standard Specification Sections 39 and 93.
- e) Paving. The asphalt concrete pavement shall be no less than the thickness as shown on the plans and shall be applied in two (2) lifts. The first lift shall be the leveling course and the second lift shall be the wearing course not less than 1" thick and shall bring the pavement to full thickness.

The finished surface shall be free from depressions exceeding 1/4" as measured with a 10-foot straightedge in any direction, except where the drawings show a grade break.
- f) Seal Coat. Seal coat shall be a Bituminous Fog Seal in accordance with Caltrans Standard Specification Section 37.
- g) Joining Existing Pavement. Existing paving which is to be joined by new paving shall be saw-cut to provide straight true neat joints.
- h) Paving Headers. Edges of paving shall be bounded by 2 x 6 net new rough cut redwood unless otherwise shown on the plans.
- i) Asphalt Curbs. Automatic curbing machines shall be used to construct asphalt curbs. The curb cross section used shall be as shown on the drawings or as approved by the District.
- j) Paving Removal. Where paving is shown to be removed on the drawings, it shall mean that all asphaltic concrete and aggregate base shall be removed.

4. Removal and Replacement

- a) General. Replacement of street, driveway, alley entrance, and other type pavements shall be of the same material as the existing pavement, constructed in accordance with the applicable drawings and specifications.

The Contractor shall install temporary asphalt pavement of the first course of permanent replacement immediately following backfilling and compaction of trenches that have been cut through pavement. Except as otherwise provided, this preliminary pavement shall be maintained in a safe and reasonably smooth condition until required backfill compaction is obtained and final pavement replacement is ordered by the Engineer. Temporary paving removed shall be hauled from the job site and disposed of at the Contractor's expense.

Where a longitudinal trench is partly in pavement, the pavement shall be replaced to the original pavement edge, on a straight line, parallel to the centerline of the roadway.

Where no part of a longitudinal trench is in the pavement, surfacing replacement will only be required where existing surfacing materials have been removed or damaged.

When the trench cut is in aggregate surfaced areas, the replacement shall be of aggregate base course material compacted to 95% of its maximum compaction.

- b) Asphalt Pavement Replacement. Asphalt pavement replacement shall be of the same thickness as the adjacent pavement and shall match as nearly as possible the adjacent pavement in texture.

Existing asphalt pavements to be removed for trenches or other underground construction or repair shall be cut by a wheel cutter, clay spade, or other device without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and its manner of operation shall be final.

The existing pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement replacement, and the trimmed edges shall be painted with a light coating of asphalt cement or emulsified asphalt immediately prior to constructing the new abutting asphalt pavements. No extra payment shall be provided for these items, and all costs incurred in performing this work shall be incidental to pipe laying or pavement replacement.

Asphalt pavement replacement shall conform to the contour of the original pavement. A 10-foot straightedge shall be laid parallel to the centerline of the trench when the trench is running parallel to the street and across the pavement replacement when the trench crosses the street at an angle. Any deviation in the cut pavement replacement and the old pavement greater than 1/4" in 10 feet (10-foot straightedge) shall be removed and corrected.

- c) Portland Cement Concrete Pavement Replacement. Where trenches lie within the portland cement concrete section of streets, alleys, driveways, sidewalks, etc., such concrete shall be saw-cut (to a depth of not less than 1½") to neat, vertical, true lines in such a manner that the adjoining surfaces will not be damaged.

The pavement replacement shall be Class "A" concrete placed to the dimension as shown on the drawings. Expansion joints shall match the existing expansion joints in the old pavement.

The surface shall be wood float finish with no greater variance than 1/4" in a 10-foot straightedge either across the pavement replacement or longitudinal with the centerline of the ditch. Any greater variance than the above 1/4" shall be cause for rejection of the pavement replacement. Before placing the concrete replacement, the edges of the old pavement shall be thoroughly cleaned and given a wash of neat cement and water.

- d) Curb, Gutter, and Sidewalk Replacement. Where any concrete curb, gutter, or sidewalk has been removed or displaced, the same shall be replaced to the nearest construction joints with new asphalt or concrete to the same dimensions, material, and finish as the original construction that was removed.

Expansion joints shall be the same spacing and thickness as on the original construction.

- e) Expansion Joints. Expansion joints shall be constructed in curb, walk, and gutter as shown on the plans or as specified herein. Such joints shall be filled with premolded joint filler. No such joints shall be constructed in crossgutters, alley intersections or driveways except as may be approved by the Engineer.

One-half inch (13 mm) joints shall be constructed in curb and gutter at the end of all returns except where crossgutter transitions extend beyond the curb return, in which case they shall be placed at the ends of the crossgutter transition. No joints shall be constructed in returns.

Where monolithic curb and gutter is constructed adjacent to concrete pavement, no expansion joints will be required except at EC and BC of curb returns. Expansion joint filler 1/4" (6 mm) thick shall be placed in walk at the EC and BC of all walk returns, around all utility poles which may project into the concrete along the line of the work, and in walk returns between the walk and the back of curb returns when required by the Engineer. At the EC and BC and around utility poles, the joint filler strips shall extend the full depth of the concrete being placed. Joint filler strips between walk and curb shall be the depth of the walk plus 1" (25 mm) with the top set flush with the specified grade of the top of curb. All expansion joint filler strips shall be installed vertically, and shall extend to the full depth and width of the work in which they are installed, and be constructed perpendicular to straight curb or radially to the line of the curb constructed on a curve. Expansion joint filler materials shall completely fill these joints to within 1/4" (6 mm) of any surface of the concrete. Excess filler material shall be trimmed off to the specified dimension in a neat and workmanlike manner. During the placing and tamping of the concrete, the filler strip shall be held rigidly and securely in proper position.

f) Weakened Plane Joints.

- (i) General. Weakened plane joints shall be straight and constructed in accordance with Subsections "Control Joint" and "Plastic Control Joint" below, unless otherwise shown on the drawings.

In walk, joints shall be transverse to the line of work and at regular intervals not exceeding 10' (3 m). At curves and walk returns, the joints shall be radial.

In gutter, including gutter integral with curb, joints shall be at regular intervals not exceeding 20' (6 m). Where integral curb and gutter is adjacent to concrete pavement, the joints shall be aligned with the pavement joints where practical.

- (ii) Control Joints. After preliminary troweling, the concrete shall be parted to a depth of 2" (50 mm) with a straightedge to create a division in the coarse aggregate. The concrete shall then be refloated to fill the parted joint with mortar. Headers shall be marked to locate the weakened plane for final joint finishing, which shall be accomplished with a jointer tool having a depth of 1/2" (13 mm) and a radius of 1/8" (3 mm). The finished joint opening shall not be wider than 1/8" (3 mm).

- (iii) Plastic Control Joints. The joint material shall be a T-shaped plastic strip at least 1" (25 mm) deep, having suitable anchorage to prevent vertical movement, and having a removable stiffener with a width of at least 3/4" (20 mm). After preliminary troweling, the concrete shall be parted to a depth of 2" (50 mm) with a straightedge. The plastic strip shall be inserted in the impression so that the upper surface of the removable stiffener is flush with the concrete. After floating the concrete to fill all adjacent voids, the removable stiffener shall be stripped. During final troweling, the edges shall be finished to a radius of 1/8" (3 mm) using a slit jointer tool.

3.04 FIELD QUALITY CONTROL

- A. Contractor's Responsibility for Safety
The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. This requirement will apply continuously 24 hours a day every day until final acceptance of the work and shall not be limited to normal working hours.
- B. Warnings and Barricades
The Contractor shall provide and maintain barricades, guards, temporary bridges and walkways, watchmen, night lights and danger signals illuminated from sunset to sunrise, and all other necessary appliances and safeguards to protect the work, life, property, the public, excavations, equipment, and materials. Barricades shall be of substantial construction and shall be painted such as to increase their visibility at night. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist. Guard rails shall be provided for bridges and walkways over or adjoining excavations, shafts, and other openings and locations where injury may occur.
- C. Fire Prevention
The Contractor's Safety Officer shall inspect the entire work and site, including storage areas, at frequent intervals to verify that fire prevention measures are constantly enforced.
- D. Fire Extinguishers and Hoses
The Contractor shall furnish and maintain fully charged fire extinguishers of the appropriate type, supplements with temporary fire hoses wherever an adequate water supply exists, at the places where burning, welding, or other operations that may cause a fire are being performed.

E. Flammable or Toxic Materials

Only a working supply of flammable or toxic materials shall be permitted on or on any of the permanent structures and improvements, and shall be removed therefrom at the end of each day's operations. The Contractor shall store flammable or toxic materials and waste separate from the work and stored materials for the work in a manner that prevents spontaneous combustion or dispersion, and none shall be placed in any sewer or drain piping nor buried on the site.

F. Safety Helmets, Clothing, and Equipment

The Contractor shall not permit any person for whom he is responsible or liable to enter or remain on the site of the work unless the person is equipped with and wearing a safety helmet and other protective clothing and safety equipment conforming to the requirements of the District or regulatory agencies, and shall discharge from the site all persons not so equipped. The Contractor shall post conspicuous signs at appropriate locations warning the public and persons engaged upon the work of this requirement. The Contractor shall furnish for their temporary use such safety helmets, protective clothing, and safety equipment as the Engineer may request of him.

G. Hazardous Areas

The Contractor shall not permit or allow any person or persons to enter any pipe or space containing hazardous or noxious substances or gases, or where there is an insufficient amount of oxygen to sustain life and consciousness, or any other hazardous area unless equipped with lawful and appropriate safety equipment and life-supporting apparatus, and unless those entering are continually monitored and guarded by and in communication with other persons outside the space or area who are equipped in the same way, can give an alarm to others for assistance, and initiate immediate rescue operations in the event of mishap.

H. Work During an Emergency

The Contractor shall perform any and all operations and shall furnish any materials and equipment necessary during an emergency endangering life or property and, in all cases, shall notify the District of the emergency as soon as practical, but shall not wait for instruction before proceeding to properly protect both life and property. Any additional compensation or extension of contract time claimed by the Contractor on account of an emergency shall be applied for as provided in the specifications.

I. Compaction Tests

All compaction tests required by either the governing agency having jurisdiction over the right-of-way or by the District shall be performed by the District or its agent at District expense. However, in the event these tests prove the compaction to be unacceptable to either the governing agency or the District, all subsequent tests required by the governing agency or the District shall be performed at the Contractor's expense.

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Tests will be scheduled within 24 hours of the Contractor's request for tests, at locations to be selected by the District and/or the governing agency. However, tests shall not be scheduled until a minimum 4-hours work is available for the testing laboratory, as determined by the Engineer. Results of these tests shall then be available within 48 hours.

In-place soil densities shall be determined by the sand cone method of test in accordance with currently adopted ASTM Standard D-1556, or by the nuclear method of test in accordance with ASTM Standard D-2922.

Optimum soil moisture-compaction relations shall be determined by the method of test specified in ASTM Standard D-1557, except as otherwise specified in the Special Conditions.

Soils testing provided by EMWD to determine compliance with the requirements of this specification does not relieve the Contractor of his/her responsibility.

In accordance with provisions for guarantee of the work, the Contractor shall return at his expense to correct any backfill conditions subsequently found to be substandard by either failure or more extensive testing. The Contractor shall provide all labor and equipment necessary to prepare for all tests and to assist the soils engineer in taking the tests, as directed by the Engineer.

J. Clean-up During Construction

The Contractor shall keep the premises occupied by him in a neat and clean condition, and free from unsightly accumulation of rubbish. Upon completion of the work and before the final estimate is submitted, the Contractor shall, at his own cost and expense, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, rock, unused and excavated materials belonging to him or used under his direction during the construction, and in the event of his failure to do so, the same may be removed and disposed of by the District at the Contractor's expense. Contractor's responsibility shall include satisfactory disposal of all debris or protective material resulting from material delivery such as plastic wrappings, pipe stulls, etc., whether or not the Contractor furnished such material.

The Contractor shall carry on his operations in such sequence and in such manner as to interfere as little as possible with other improvements. When the construction is adjacent to or on residential property or cultivated fields or orchards, disposal of material and backfill operations shall be performed in such manner as to restore the properties to their original condition as nearly as practical as determined by the Engineer. Topsoil shall be carefully removed, stockpiled, and replaced after the backfill is placed.

As a part of the clean-up operation on facilities in private right-of-way, the Contractor shall restore the soil the full width of the right-of-way to a mechanical condition equivalent to that which existed at the time of the construction operations on such areas, by thoroughly loosening the soil with subsoilers, or other acceptable means and by discing and leveling if necessary, any stones, gravel, or other deleterious material left in spoil banks. On such lands debris shall be removed by the Contractor before his final preparation of the soil and shall be disposed of as required for excavated materials.

In unimproved areas the finish surfaces over pipelines shall be graded to drain surface water away from the center line of the actual trench and provide drainage away from all the structures. No ponding of surface water will be allowed within the construction right-of-way.

Contractor shall complete total trench restoration (original condition or better) within 1,320 feet of trench heading or within 10 working days of construction, whichever represents the least amount of time. Failure of the contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

END OF SECTION 02201

Revised: 05/02/12

SPECIFICATIONS - DETAILED PROVISIONS
Section 02221 - Trenching, Backfilling, and Compacting

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**SECTION 02221
TRENCHING, BACKFILLING, AND COMPACTING**

PART 1 - GENERAL

1.01 SUMMARY

- A. Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the work.
- B. Verification of Existing Conditions. It shall be the responsibility of the Contractor to examine the site of the work and to make all investigation necessary, both surface and sub-surface, to determine the character of materials to be encountered and all other existing conditions affecting the work.
- C. Lines, Grades and Measures. All lines and grades will be established by the Engineer, and the Contractor shall provide him with such assistance and materials as may be required. The Contractor shall carefully preserve all survey stakes and reference points. SHOULD ANY STAKES OR POINTS BE REMOVED OR DESTROYED BY ANY ACT OF THE CONTRACTOR OR HIS EMPLOYEES THEY MAY BE RESET AT THE CONTRACTOR'S EXPENSE.
- D. Compliance with Regulations. The Contractor shall familiarize himself, and comply with all applicable federal, state, county and municipal rules and regulations pertaining to sanitation, fire protection, and safety.
- E. Contractor's Equipment. The Contractor shall provide such modern plant and equipment as may be necessary in the opinion of the Engineer to perform in a satisfactory and acceptable manner, and in accordance with the specifications, all the work required of the Contractor.
- F. Representatives for Emergencies. The Contractor shall file with the District a written list giving the names, addresses, and telephone numbers of at least two (2) of his representatives who can be contacted at any time in case of emergency. The representatives shall be fully authorized and equipped to correct unsafe or inconvenient conditions on short notice. The Contractor shall promptly notify the District of all changes in the listing.
- G. Water Supply. The Contractor may obtain water for work under this specification from the sources as stated in the Special Provisions and Requirements of this specification.

1.02 STRUCTURE PROTECTION

- A. Contract Drawings. The drawings identify the various pipes, conduits, and other existing utility structures as they are supposed to exist in construction areas, but no error or omission on said drawings shall be construed to relieve the Contractor from the responsibility of protecting any such pipe, conduit, or other existing utility structures.

When deemed necessary by the Engineer, revisions of the contract drawings and additional detailed drawings will be issued to the Contractor during the progress of the work.

- B. Notification of Underground Service Alert of Southern California. When performing underground work, the Contractor shall call Underground Service Alert (USA), the one-call underground facility locating service two (2) working days prior to making an excavation. Contractor shall be responsible for such notification of sub-contractor's work, or shall require sub-contractor to assume this responsibility.
- C. Operation of Utilities. No District valves, or appurtenances of other utility facilities shall be operated by the Contractor without approval and/or instruction from the District or the utility, as appropriate.

1.03 JOB CONDITIONS

- A. Safeguarding Excavations and Property. Excavations shall be adequately shored and braced so that the earth will not slide or settle and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from a lack of adequate shoring and bracing shall be the responsibility of the Contractor. The Contractor shall affect all necessary repairs or reconstructions at the Contractor's own expense as directed by the Engineer and shall bear all other expenses resulting from such damage.
- B. Safety Measures. Each bid proposal submitted under these specifications for the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, or the use of such a trench or open excavation, shall include in appropriate bid items for such work the costs necessary to provide adequate sheeting, shoring, and bracing, or equivalent method for the protection of life or limb, which shall conform to applicable safety orders, including the Construction Safety Orders of the California Division of Industrial Safety, in accordance with the requirements of the California Occupational Safety and Health Act.

1.04 GUARANTEE

The Contractor hereby guarantees that the entire work constructed by him under the contract will fully meet all the requirements thereof as to quality of workmanship, and of materials furnished by him.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Select Backfill Material, and Special Bedding and Backfill. Select backfill material shall be selected from the excavated material or imported when not available from the excavated material. In either case, it shall be provided at the Contractor's expense, and shall be included in the costs proposed for pipeline installation on the bidding sheets.

Provide soil materials free from organic matter and deleterious substances, containing no rocks over 3" in greatest dimension, and with no more than 15% of the rocks over 2" in their greatest dimension.

Where called for on the plans or in these specifications, and not covered by a separate bid item, special bedding or backfill shall be included in pipeline construction costs on the bidding sheets.

Where required by the governing agency or by the District to meet compaction requirements of these specifications, or requirements of these specifications for bedding or for select granular backfill, special bedding or imported backfill and disposal of excavated spoil shall be provided at the Contractor's expense.

The requirements for special bedding and backfill at the Contractor's expense as described herein as a part of the Special Conditions or as shown on the Contract Drawings shall supersede and take precedence over any and all other requirements for measurement and/or payment for special bedding or backfill found elsewhere in these specifications. Bedding is defined herein to include sand, rock or concrete base, cradle, or encasement. Backfill material is defined herein to include backfill for both trench backfill and pipe bedding (or pipe zone backfill).

Special bedding or backfill not called for on the plans or in these specifications, but required by the Engineer over and above the requirements of this specification, shall be constructed at additional cost, at prices reflecting current material costs as evidenced by paid vouchers, plus 50% to cover all costs of installation and overhead.

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The encounter of ground water not anticipated in engineering reports made available for this contract, and the required over-excavation and construction of a stable base as determined necessary by the Engineer shall be considered over and above the requirements of this specification, and the required base shall be paid for at the above stipulated prices.

PART 3 - EXECUTION

3.01 WEATHER LIMITATIONS

Excavating and grading shall be performed only when the weather conditions do not adversely affect the quality of the finished product. Any graded or excavated areas that are damaged by the effect of rain, or other weather conditions, during any phase of the construction, shall be re-excavated, regraded, and recompacted to conform to the herein specified requirements, without additional cost to the District.

3.02 PREPARATION

- A. Control of Water. The Contractor shall acquire such permits and take such measures as may be required, and shall furnish, install, and operate such pumps or other devices as may be necessary to remove any seepage, storm water, or sewage that may be found or may accumulate in the excavations during the progress of the work. The Contractor shall keep all excavations entirely free from water at all times during the construction of the work and until the Engineer gives permission to cease pumping.

He shall keep the complete work reasonably free from accumulations of water and sewage, and shall free it entirely at such times as may be required by the Engineer for inspection or other purposes. Any accumulated water or sewage thus pumped shall be disposed of in accordance with good practice and local ordinances.

The Contractor shall provide an adequate dewatering system for the control of surface and groundwater seepage into the excavations as may be required during the construction period. The proposed plan of this dewatering system shall be submitted to the Engineer for concept approval prior to the installation of the system.

3.03 CONSTRUCTION

- A. Excavation. The Contractor shall perform all excavation necessary or required for the construction of the facilities covered by these specifications. Excavations may be performed by either hand or machine methods and shall be of sufficient size to provide adequate space for working in accordance with safety regulations

and practice and the Contract Drawings. Excavations shall include the removal and disposal of all materials of whatever nature and quantity including water, rock, decomposed granite, or any other type of soil or material, subsurface obstructions and also overhead obstructions which may interfere with the operation of equipment used on the work, for no additional compensation. Excavation for foundations shall be made only after construction of subgrade, as hereinafter described, has been completed. Over excavation for foundations shall be filled with concrete.

1. Trench Excavation. Unless otherwise specified in the Special Conditions or on the Contract Drawings, pipeline trenches shall have a minimum clear distance of 6" and a maximum of 9" on each side of the pipe barrel when the pipe is properly placed and aligned in conformity with the Contract Drawings.

The maximum length of trench which shall be opened or partially opened at any one time shall be limited to 500' for sewer lines and one-half mile for water pipelines, except where governed by other agencies or approved by the Engineer. Bell holes or depressions shall be dug by hand at the proper locations of sufficient size to adequately work the joints, but no larger than is required.

When the trench is excavated to the line and grade as shown on the drawings, and the bedding material encountered is rock, the trench shall be excavated an additional depth of at least 4" below the grade for the bottom of the pipe, and the bottom of the trench shall be refilled with approved material, moistened and compacted by tamping or by other approved method to the satisfaction of the Engineer.

Where ground water is encountered and the native material does not afford a solid foundation for pipe subgrade as specified above, the Contractor shall excavate to such depth below subgrade as determined necessary by the Engineer and shall construct a stable base by placing crushed rock bedding upon which subgrade can be prepared. Crushed rock for bedding shall be one and one-half inch (1 1/2") maximum size.

When the trench has been inadvertently excavated below the designed grade, at the Contractor's expense, the bottom of the trench shall be refilled with approved material, well compacted into place in an approved manner and to the satisfaction of the Engineer.

Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining, as directed by the engineer but not less than 90% of maximum compaction. This work is to be done at no extra cost to owner.

Where trenching occurs in existing turf areas, remove turf in sections and keep roots damp. Replace turf upon completion of backfilling.

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2. Cover. Provide minimum trench depth indicated below to maintain a minimum cover over the top of each listed utility, unless otherwise indicated in specifications or on the drawings.
 - a) 1. Water lines: 48"
 - b) 2. Gas lines: 24"
 - c) 3. Electrical lines: 36"

3. Excavated Materials. Shall be piled neatly along the side of the trench and adjacent to manhole excavations in such a manner as to be of as little inconvenience as possible to the public traffic or the occupants of the adjacent property.

Through all cultivated areas, topsoil removed from excavations shall be replaced as backfill in the uppermost part of the excavation to a depth as it existed previous to excavation, not exceeding 18". Where topsoil replacement is required, excavated topsoil shall be stored separately from other materials and in general shall be replaced as backfill in the same parcel of land from which it came.

4. Disposal of Excavated Materials. Insofar as space is available in the right-of-way, such space may be used for temporary storage of excavated material, to be used for backfill, provided that no material shall be stored or deposited in violation of any ordinance or regulation prohibiting the filling or obstructing of water courses in drainage channels. All materials removed from the excavations in excess of that stored temporarily as above specified shall be immediately hauled away and used in backfilling elsewhere, or, if not used, shall be disposed of by the Contractor. The disposal area shall be acquired by the Contractor.

No materials shall be disposed of either temporarily or permanently on privately or publicly owned property unless the Contractor shall first obtain permission therefore from the owner or agency concerned. The Contractor shall furnish satisfactory evidence to the Engineer that such consent has been obtained and shall be responsible for all damages and claims that may arise in connection therewith.

5. Bracing and Shoring. The Contractor shall furnish, place and maintain such bracing and shoring as may be required to support the side of the excavations for the proper protection of workmen, to facilitate the work and prevent damage to the pipes and manholes being constructed, and to prevent damage to adjacent structures or facilities. Upon completion of the work, all bracing and shoring shall be removed unless otherwise directed or permitted by the Engineer.

- B. Fill, Backfill and Grading shall include all scarifying, moistening, compacting, and other manipulations of the soil necessary to obtain the required densities, cross sections, lines, grades and surface finish indicated or specified.

Backfill shall not be placed in trenches or excavations until the pipelines and structures in the particular section involved have been inspected and approved for backfilling by the Engineer.

All excavations outside the completed pipelines and structures shall be backfilled with compacted material to the level of the original ground surface unless otherwise shown on the drawings or ordered by the Engineer. The materials used for backfill shall be imported, selected material, or approved selected excavated materials and shall be placed as directed by the Engineer. All materials placed within 6" of the pipe or structure shall be free from rocks or boulders larger than 1 1/2" maximum dimension, and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets in the excavation.

Unsuitable material encountered at the surface upon which the bedding material is to be placed shall be removed to a depth as determined in the field by the Engineer. Unsuitable material shall be as determined by the Engineer. If not otherwise specified, removal of material and additional bedding so ordered over and above the amount required will be paid for in accordance with the specifications unless, however, the necessity for such additional bedding materials has been occasioned by an act or failure to act on the part of the Contractor, in which event the Contractor shall bear the expense of the additional excavation and backfill to the required depth. The Contractor's attention is called to "dewatering" procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water in the trench excavation.

Imported materials (if any) required for fill or backfill shall be provided by the Contractor from areas outside the site at his own expense. Such material shall be as herein specified and must be approved by the District before delivery to the site.

1. Structure Backfill. The Contractor shall place all backfill about structures to the original ground level, or to the lines shown on the drawings or prescribed by the Engineer. Fill materials shall be of earth only, and be free from debris, vegetation, alkali, or other deleterious substances.

All backfill about structures shall be placed in layers not more than 6" thick prior to compaction, which shall be obtained by moistening to optimum moisture content prior to placing and compacting to maximum compaction by use of suitable equipment approved by the Engineer.

The Contractor shall take all necessary precautions to protect the structure and underground facilities during the placement, compacting or consolidating, and grading of backfill.

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2. Pipeline Backfill. Except as otherwise required by the construction plans or the standard drawings, the material used in backfilling to 1' above the pipe shall be cohesionless, sandy, or sandy gravel material obtained from required excavation or from approved borrow areas, as shown on the Contract Drawings or as directed by the Engineer. This material shall be carefully placed and compacted to provide a firm continuous bedding and encasement for the pipe. Pipe shall be shaded the same day it is laid to protect it from possible damage and/or thermal expansion. Pipe zone backfill shall be consolidated by mechanical tamping.

Deposit approved backfill and bedding material, in the lower portion of the trench, in layers of 6" maximum thickness, and compact with suitable mechanical tampers to a density not less than 85%, or grade as specified in special conditions of contract, until there is a cover of not less than 24" for sewer lines and 12" over other utility lines. Care must be taken to not damage the pipe.

The remaining trench backfill shall consist of select backfill material from the excavation, when available, free from stones or lumps exceeding 3" in greatest dimension, and free from vegetable matter or other unsatisfactory material. This select material as defined herein and elsewhere in these specifications, shall be placed in layers not exceeding 2' in depth, unless otherwise directed by the Engineer. Each lift shall be consolidated in such a manner that the backfill will meet the requirements of compaction to 90% maximum density per ASTM D1557-09. Care shall be taken not to disturb the backfill previously placed, and the Contractor shall at all times protect the pipe against flotation. All material from failed test to successful test shall be removed, recompacted and retested.

3. Compacting and Surfacing. Except as otherwise specifically required by the encroachment permit or elsewhere in these specifications, the following requirements will apply:

The upper portion of the final lift will be backfilled with selected material from the excavation, moistened to optimum moisture content and compacted by mechanical tamping to meet the requirements of the District standards, of 95% maximum compaction. All backfill in public roads shall be consolidated and surfacing shall be placed to meet State of California and Riverside County requirements as stated in the respective permit, whether or not required by the inspector for that particular agency - unless otherwise approved by the Engineer.

Where backfill is in areas not within public roads, it shall be consolidated and tested to meet the requirements of these specifications, except as otherwise approved by the Engineer.

Minimum acceptable field densities specified in District standards shall be determined in accordance with the testing procedures set forth elsewhere in these specifications.

Where sand material of an approved grade is used for backfilling, mechanical compaction may be eliminated and compaction obtained by jetting.

Except as otherwise directed by the Engineer, after a period of not less than 30 days or more than 60 days, any settlement shall be filled with decomposed granite.

3.04 FIELD QUALITY CONTROL

- A. Contractor's Responsibility for Safety. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. This requirement will apply continuously 24 hours a day every day until final acceptance of the work and shall not be limited to normal working hours.
- B. Warnings and Barricades. The Contractor shall provide and maintain barricades, guards, temporary bridges and walkways, watchmen, night lights and danger signals illuminated from sunset to sunrise, and all other necessary appliances and safeguards to protect the work, life, property, the public, excavations, equipment, and materials. Barricades shall be of substantial construction and shall be painted such as to increase their visibility at night. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist. Guard rails shall be provided for bridges and walkways over or adjoining excavations, shafts, and other openings and locations where injury may occur.
- C. Compaction Tests. All compaction tests required by either the governing agency having jurisdiction over the right-of-way or by the District shall be performed by the District or its agent at District expense. However, in the event these tests prove the compaction to be unacceptable to either the governing agency or the District, all subsequent tests required by the governing agency or the District shall be performed at the Contractor's expense.

Tests will be scheduled within 24 hours of the Contractor's request for tests, at locations to be selected by the District and/or the governing agency. However, tests shall not be scheduled until a minimum 4-hours work is available for the testing laboratory, as determined by the Engineer. Results of these tests shall then be available within 48 hours.

In-place soil densities shall be determined by the sand cone method of test in accordance with ASTM Standard D-1556-64, or by the nuclear method of test in accordance with ASTM Standard D-2922-071.

Trenching, Backfilling, and Compacting
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In accordance with provisions for guarantee of the work, the Contractor shall return at his expense to correct any backfill conditions subsequently found to be substandard by either failure or more extensive testing. The Contractor shall provide all labor and equipment necessary to prepare for all tests and to assist the soils engineer in taking the tests, as directed by the Engineer.

In unimproved areas the finish surfaces over pipelines shall be graded to drain surface water away from the center line of the actual trench and provide drainage away from all the structures. No ponding of surface water will be allowed within the construction right-of-way.

Contractor shall complete total trench restoration (original condition or better) within 1,320 feet of trench heading or within 10 working days of construction, whichever represents the least amount of time. Failure of the contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

END OF SECTION 02221

Revised 030907

SPECIFICATIONS - DETAILED PROVISIONS
Section 02252 - Control Density Fill

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**SECTION 02252
CONTROL DENSITY FILL**

PART 1 - GENERAL

1.01 DESCRIPTION

Control Density Fill (CDF) is used as a low strength, self consolidating fill material for confined spaces which can be easily excavatable at a later time. CDF is characterized by a high maximum slump of 8 inches. CDF is not a structural concrete and should not be used in such applications.

CDF may be used as a trench backfill, structural backfill, pipe bedding, or pipe filling for abandonment in place. CDF shall consist of Portland cement, aggregates, water and fly ash. Chemical admixtures and other mineral admixtures may be used.

The actual mix proportions and flow characteristics shall be determined by the producer of the CDF to meet site conditions. Mix designs and performance tests shall be submitted to the Engineer for approval.

1.02 UTILITY TRENCH CDF MIX DESIGN (PER CUBIC YARD)

A.	Cement	50 – max lbs
B.	Fly Ash (Type F)	50 - 150 lbs
C.	Total Mix Water	35 gallons Max.
D.	Stable Air Content	20 - 30%

CDF shall be hand excavatable and shall contain aggregate no larger than 3/8 inch and the 3/8 inch aggregate shall comprise no more than 20 percent of the total aggregate content.

PART 2 - PRODUCT

2.01 PORTLAND CEMENT

Portland cement shall conform to the requirements of Section 03300, Part 2.01 A of the EMWD Specifications.

2.02 AGGREGATES

Aggregates shall conform to the requirements of Section 03300, Part 2.01 B of the EMWD Specifications, except as follows. Aggregates shall be pretested in CDF mixtures similar to those anticipated for the work, confirming their ability to perform as required for the specific application. Aggregates not in conformance with Section 03300 may be used when approved by the Engineer, providing the material has a minimum sand equivalent of 20, the percentage passing the No. 200 sieve does not exceed 12 percent, and the fines are non-plastic.

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2.03 WATER

Water shall be free of oils, acids, alkalies, organic matter or other deleterious substances.

2.04 ADMIXTURES

Admixtures shall conform to the requirements of Section 03300, Part 2.01 C of the EMWD Specifications.

2.05 FLY ASH

Fly ash shall conform to the requirements of ASTM C 618, Class F. Fly ash as a percent by weight of total cementitious material, shall not exceed 20 percent.

PART 3 - EXECUTION

3.01 MIXING

Mixing shall conform to the requirements of Section 03300, Part 2.03 of the EMWD Specifications, except for the one and one-half hour time limit specified in Paragraph B of Part 2.03. Unless otherwise specified, under conditions contributing to quick setting, the Engineer may specify a time limit, not to exceed two and one-half hours.

When CDF is used underneath a paved public right-of-way, the mixture shall contain a minimum of 25 pounds per cubic yard of cement when using washed concrete sand.

Adjustment of the mixture to achieve improved placement characteristics shall be through the use of chemical admixtures. No increase in water content or water to cement ratio will be allowed.

3.02 TESTING

CDF shall be tested for plastic unit weight. Plastic unit weight shall not deviate more than ± 10 percent of theoretical unit weight shown on the approved mix design. Unit weight shall be determined in accordance with ASTM C138.

CDF's consistency shall be tested by the slump method. The slump shall be measured in accordance with ASTM C143.

3.03 PLACEMENT

CDF may be placed by chutes, conveyors, buckets or pumps depending upon the application and accessibility.

For trench backfill, CDF shall be placed continuously. To contain CDF when filling long open trenches or open ended structures in stages, the end points shall be adequately bulkheaded to prevent movement. Methods may include bulkheading with sandbags, earth dams, forms or stiffer mixtures of CDF. CDF shall be placed from the centerline of mainline utilities to the bottom of the excavation.

For bedding, CDF shall be placed in a manner to prevent flotation or displacement of the embedded item. Methods of preventing flotation or displacement may include placement of CDF in lifts, faster setting CDF or lower slump CDF over the embedded item.

For backfilling of pipelines to be abandoned in place, CDF shall be pumped into the pipeline to be abandoned. It is intended that the disconnected ends of the pipeline shall be the primary means for injecting CDF into the pipeline. The Contractor may excavate for additional injection points along the pipeline. The pipeline shall be filled uniformly to within 90 percent of the pipe soffit. The lack of voids (other than the top 10 percent) shall be demonstrated to the Engineer by breaking out small sections of pipeline in various critical locations.

Pavement may be placed directly upon the CDF as soon as the surface will withstand the paving process without displacement or disruption. If the placement of the CDF is not completed in time to allow permanent paving to be completed the same day, the Contractor shall prevent traffic contact with the CDF until paving is completed.

END OF SECTION 02252

Revised 08/92

SPECIFICATIONS - DETAILED PROVISIONS
Section 02505 - Roadway Base Course

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**SECTION 02505
ROADWAY BASE COURSE**

PART 1 - GENERAL

1.01 REQUIREMENT

Work included under this specification shall include furnishing all labor, equipment and tools required for the complete construction of roadway base course as shown on the Bidding Sheets, shown on the Contract Drawings and specified herein, all within the time stated in the Special Requirements of this specification.

Included in the work of roadway base course construction is all clearing, stripping, excavating, scarifying, compacting, haul and overhaul, trimming and placing, as specified on plans or in Detailed Provisions. The Contractor shall furnish all material not specifically called for as furnished by the District.

1.02 CONSTRUCTION WORK AND METHODS

Rights of Way and Land. The District will provide the rights-of-way and acquire the land necessary for the construction of the work under this specification. Neither the terms hereof nor anything shown on the drawings shall be construed to entitle the Contractor to conduct operations in violation of any public agency ordinance or regulation restricting interference with water courses, drainage channels, roads, alleys or streets, until he had obtained permits therefore from the proper authorities.

In all the streets in which his work may interfere with ingress or egress of the occupants of the abutting property or of their vehicles, the Contractor shall maintain temporary practicable means of ingress and egress, or shall make satisfactory arrangements with the occupants for the obstructing of ways to their properties for the duration of the interference. Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street or way during performance of the contract work, and he shall so conduct his operations as not to interfere unnecessarily with the authorized work of other agencies in such streets and ways.

1.03 CONSTRUCTION WORK

It shall be the responsibility of the Contractor to meet with the Engineer regarding the equipment and methods to be used in the construction of the work, and for approval of the order and schedule of the work.

1.04 COMPLIANCE WITH REGULATIONS

The Contractor shall familiarize himself and comply with all applicable state, county and municipal rules and regulations pertaining to sanitation, fire protection, barriers, warning lights and signs.

1.05 DUST ABATEMENT

The Contractor shall furnish all labor, equipment and means required and shall carry out protective measures wherever and as often as necessary in the opinion of the Engineer to prevent his operations from producing dust in amounts damaging to property or causing nuisance. The Contractor shall be responsible for any damage resulting from dust originating from his operations. The dust abatement measures shall be continued until all required resurfacing is completed or until the Contractor has completed arrangements with the proper authorities whereby he is relieved of further responsibility. Such arrangements shall be approved by the Engineer prior to their completion. All compensation to be received for dust abatement shall be included in the prices named for appropriate items of the bidding sheet.

1.06 LINES, GRADES AND MEASURES

All lines and grades will be established by the Engineer and the Contractor shall provide him with such assistance and materials as may be required. The Contractor shall carefully preserve all survey stakes and reference points as far as possible. Should any stakes or points be removed or destroyed unnecessarily by any act of the Contractor or his employees, they may be reset at the Contractor's expense.

The Contractor shall inform the Engineer a reasonable length of time in advance of the times and places at which he intends to work in order that lines and grades may be furnished, that inspection may be provided, and that necessary measurements for records and payments may be made with minimum inconvenience.

1.07 RIGHT TO OCCUPY COMPLETED PORTIONS OF WORK

The District may wish to occupy or place in service portions of the completed work before final completion of the contract work and shall be at liberty to do so, but such occupancy or placing in service of any completed portion of the work shall not void the contract nor relieve the Contractor of his responsibility of protection and care of all work until final completion and acceptance of the entire work, provided, however, that expense directly attributable to operation and placing in service the portions of the work shall not be chargeable to the Contractor.

1.08 MAINTENANCE OF UTILITIES

Insofar as practical during the progress of the work the property of any owner of a public utility pipeline or conduit, sewer, culvert, storm drain, drainage ditch, flood control channel, overhead wires or cables, or underground wires or cables, or any other structure of facility shall not be disturbed but shall be supported and protected against injury and maintained in good operating condition at the expense of the Contractor. In no case shall any such property be disturbed or removed without the consent of the owner and approval of the Engineer. The Contractor shall be responsible for making good all damage due to his operations and the provisions of this section shall not be abated even in the event such damage occurs after backfilling, or is not discovered until after completion of backfilling.

The drawings show the position of various pipes and conduits and other structures as they are supposed to exist in construction areas, but the Contractor before commencing excavation shall ascertain from records and otherwise the existence, position and ownership of such facilities and no error or omission on said drawings shall be construed to relieve the Contractor from the responsibility of protecting any such pipe, conduit, or other structure.

1.09 SAFEGUARDING EXCAVATIONS AND PROTECTING PROPERTY

Excavations shall be adequately shored and braced so that the earth will not slide or settle and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from a lack of adequate shoring and bracing shall be the responsibility of the Contractor. The Contractor shall effect all necessary repairs or reconstruction at the Contractor's own expense as directed by the Engineer and shall bear all other expense resulting from such damage.

1.10 WASTE WATER

The Contractor shall take care of drainage water on construction operations and of storm water and waste water reaching the right of way from any source so that no damage will be done to the materials or work under construction. The Contractor shall be responsible for any damage to persons or property on or off the right of way due to such diversion of storm or waste water on account of his operations. Adequate flumes shall be provided for conveying storm water around the work wherever runoff from tributary drainage areas exists.

1.11 CLEANING UP DURING THE PROGRESS OF WORK

The Contractor shall keep the premises occupied by him in a neat and clean condition, and free from unsightly accumulation of rubbish. Upon completion of the work and before the final estimate is submitted, the Contractor shall, at his own cost and expense, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings rubbish, unused materials, concrete forms, and other equipment and materials belonging to him or used under his direction during the construction, and in the event of his failure to do so, the same may be removed and disposed of by the District at the Contractor's expense.

Fences on the right of way shall be removed by the Contractor where necessary for the performance of the work and where required shall be rebuilt in as good condition as found. Where designated, fences shall be maintained until the work is completed or their removal is authorized. Where the Contractor removes existing fences to facilitate the work, temporary fence protection for lands adjacent to the right of way shall be provided at all times during the continuation of the Contract. Such temporary fence protection shall be adequate to prevent livestock from straying from or onto adjacent lands and shall be constructed complete with gates and/or cattle guards. The cost of all work described in this paragraph shall be included in the prices bid in this schedule or other items of work.

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Through all cultivated areas where trench backfill is required, topsoil removed from excavations shall be replaced as backfill in the uppermost part of the excavation to a depth as it existed previous to excavations, not exceeding 18 inches. Where topsoil replacement is required, excavated topsoil shall be stored separately from other materials and in general shall be replaced as backfill in the same parcel of land from which it came. Any damage to crops outside the right of way or land acquired for the work shall be paid for by the Contractor.

1.12 BLASTING

The use of explosives on the work shall be subject to the approval of the Engineer. All operations involving the handling and storage and use of explosives shall be conducted with every precaution prescribed by the Construction Safety Orders of the Division of Industrial Safety of the State of California and by local laws and regulations. Only competent, reliable persons, working under experienced supervisors shall be permitted to use explosives. The Contractor will be held responsible for and shall make good any damage caused by blasting or otherwise resulting from disposition or use of explosives on the work.

1.13 GUARANTEE

The Contractor hereby guarantees that the entire work constructed by them under this specification will fully meet all requirements thereof as to quality of workmanship and conformance to plans and specifications. The Contractor hereby agrees to make, at his own expense, any repairs or reconstruction made necessary by defective workmanship supplied by him, which may become evident within one year after the date of notice of completion and acceptance of the work is filed, and to restore to full compliance with the requirements of these specifications any part of the work which during said one year period is found to be defective or deficient with respect to any provision of these specifications. The Contractor shall make all such repairs or reconstruction promptly upon receipt of written orders for same from the Engineer. If the Contractor fails to make the repair or reconstruction promptly, the District may do the work, and the Contractor and his surety shall be liable to the District for the cost thereof.

1.14 SUPERVISION BY ENGINEER

The grading operations will be under the direct supervision of an Engineer employed by the District. The exact nature of the soils as they are disclosed will be evaluated by the Engineer, and he will make all final determinations as to the adequacy of work performed on the site. The Engineer will make such tests as are necessary to assure proper performance of the work.

END OF SECTION 02505

SPECIFICATIONS - DETAILED PROVISIONS
Section 02513 - Asphalt Concrete Paving

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SECTION 02513
Asphalt Concrete Paving

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor necessary for the furnishing, placing, and compacting of asphalt concrete work and base to the lines, grades, and dimensions shown on the drawings and as specified herein. Conform to applicable requirements of Conditions of Contract.

A. Work Included. Principal items are:

1. Class 2 base.
2. Wooden headers.
3. Fine grading.
4. All asphalt concrete pavement including dikes or berms.
5. All incidental asphaltic prime coats and tack coats.
6. Coal tar sealer.

1.02 QUALITY ASSURANCE

Quality assurance includes the requirements of this specification and/or as otherwise shown on the drawings; the entire work shall be in compliance with the provisions of the latest California Department of Transportation Caltrans Standard Specifications and, where appropriate, the Riverside County Transportation Department.

In case of conflict between any requirements set forth in this section and any provisions of said standard specifications, the most stringent requirement will govern. Where otherwise specified in the Special Provisions or on the drawings, those requirements shall govern.

PART 2 - PRODUCTS

2.01 AGGREGATE BASE COURSE

Aggregate Base Course shall be Class II aggregate base. The aggregate base course shall be the thickness shown on the plans and shall be placed in maximum 4" lifts. Aggregate base course shall be compacted to 95% of maximum compaction, as specified by ASTM D-1557. Aggregate base course shall be furnished, spread and compacted, as specified for Class II Aggregate Base Course in the Standard Specifications, State of California, Department of Transportation, latest edition. A spreader box will not be required but care shall be taken to prevent segregation during placement.

Asphalt Concrete Paving
Section 02513 – 2

2.02 ASPHALT CONCRETE

Asphalt concrete shall conform to the requirements of Caltrans Standard Specifications Section 39, for Type "B". Aggregate will conform to a grading for 1/2" maximum aggregate with paving grade asphalt PG 64-10 (Section 92) unless otherwise directed by the Engineer.

2.03 ASPHALT BINDER

Asphalt binder to be mixed with aggregate shall be paving asphalt PG 70-10 or liquid asphalt (Section 93) in accordance with Caltrans Standard Specifications 39, 92, and 93. Paving asphalt to be mixed with aggregate shall be steam-refined asphalts.

2.04 PRIME COAT

When indicated on the Plans or in the Special Provisions, a prime coat consisting of Grade SC-250 liquid asphalt shall be applied in accordance with Caltrans Standard Specification Sections 39 and 93.

2.05 PAINT BINDER

Liquid asphalt for paint binder shall conform to the provision of Caltrans Standard Specification Section 93.

2.06 TACK COAT

Tack coat shall be Type SS1H grade Anionic Asphaltic Emulsion as per Caltrans Standard Specification Section 94.

2.07 SEAL COAT

Seal coat shall be a Bituminous Fog Seal in accordance with Caltrans Standard Specification Section 37.

2.08 DIKES OR BERMS IN PLANT-MIXED SURFACING

Where shown on the contract drawings, dikes or berms shall be constructed along the edges of the pavement.

2.09 WOODEN HEADERS

Where indicated at edges of asphalt concrete pavement, 2" x 4" redwood headers shall be construction grade as per California Redwood conforming to the requirements of Caltrans Standard Specification Sections 57 and 58.

PART 3 - EXECUTION

3.01 GENERAL

Asphalt concrete paving shall conform to the latest Caltrans Standard Specifications, unless otherwise specified.

3.02 PLACEMENT

Included in the placement of the asphalt concrete paving is all fine grading for paving; placement of header boards; subgrade preparation; trimming and preparation of adjoining pavement; prime coat, asphalt concrete paving materials; placing, spreading, and rolling; seal-coating; and clean-up. No ponding of water on finish surface will be permitted.

3.03 TEMPORARY PAVING

When temporary paving is required the paving shall be spread either with a District approved spreader or a grader and compacted so there is a smooth transition from the undisturbed paving and the temporary paving. The temporary paving shall be maintained to provide a smooth transition as described above until such time that the permanent paving is placed.

Prior to placing the temporary paving, the Contractor shall level and compact the backfill on which the temporary paving is to be placed. Temporary paving shall be placed as soon as the condition of the backfill is suitable to receive it and shall remain in place until the condition of the backfill is suitable for permanent paving. The grade of the backfill on which the temporary paving is to be placed shall be such as to provide a full thickness of temporary paving specified.

3.04 PRIME COAT

The prime coat shall be uniformly applied over areas designated at the applicable rate of 0.25 gallons per square yard, unless the Engineer specifies a different application rate at the time of the work.

3.05 ASPHALT CONCRETE PAVING

Asphalt concrete paving, as shown on the drawings, shall be constructed over a completed and primed subgrade; construction shall conform to the applicable requirements of Caltrans Standard Specification Section 39.

When more than 1 lift of asphalt paving is required the Contractor may place the first (1st) lift with a District approved spreader box or a self propelled paving machine meeting the requirements of Caltrans Standard Specification Section 39.

3.06 TACK COAT

Application of tack coat shall be in conformance with the applicable requirements specified in Caltrans Standard Specification Section 94. Tack coat shall be applied to all vertical surfaces of walls, headers, concrete slabs, pavement joints, and similar faces against which asphalt concrete pavement is to be placed. Tack coat to be applied at rate of 0.1 gallons per square yard.

3.07 WOODEN HEADERS

Wooden headers shall be 2" x 4" construction grade California Redwood, with redwood side stakes 12" -- 2" x 4" set at a maximum of 6' on centers, at all locations where the vertical edges of the proposed asphalt pavement are not in contact with an existing pavement or permanent structures. Headers shall remain in place upon completion of work.

Asphalt Concrete Paving
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3.08 SEAL COAT

Seal coat shall be applied 6 to 10 weeks after the asphalt is laid. One application of 0.05 to 0.10 gallons per square yard will be required. All other conditions and/or methods of application shall be in accordance with Caltrans Standard Specification Section 37.

END OF SECTION 02513

SPECIFICATIONS - DETAILED PROVISIONS
Section 02718 - Installation of Water Pipeline

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**SECTION 02718
INSTALLATION OF WATER PIPELINE**

PART 1 - GENERAL

1.01 DESCRIPTION

Under these specifications, the Contractor shall furnish all labor, material, equipment and tools required for the complete installation and testing of pipe and pipeline appurtenances and allied structures as stated on the Bidding Sheets, shown on the contract drawings or specified herein, and all within the contract time. The Contractor shall be responsible for all work specified herein and the orderly progress and completion of the work in accordance with an approved schedule of construction.

The work includes, but is not limited to, all excavation, backfill, disposal, resurfacing of roads and driveways, verification of utilities, installation of all pipe and pipeline fittings/specials such as crosses, tees, elbows, bends, joint restrainers, couplings, tapers, butt straps and all necessary cuts and welds. All anchorage for pipe, such as at the ends of lines, at crosses, tees, elbows, bends, etc., shall be sufficient to withstand all unbalanced forces. Unless otherwise approved by the Engineer, anchorage shall be provided by means of double pass, full welds of all steel pipe joints, restraint fittings for plastic (PVC) pipe, or ductile iron pipe, as required by the Contract Drawings and these specifications. The use of concrete anchorage in lieu of restrained joints will be considered on a case by case basis. All welding and restraint shall be included in the bid price for the installation of pipe.

It shall be the responsibility of the Contractor to furnish the District with accurate tie dimensions to all valves installed in the course of constructing this project.

Refer to Section 02201 of the District's standard specifications for requirements relating to Construction Methods and Earthwork and Section 02221 for requirements relating to Trenching, Backfilling and Compacting.

1.02 QUALITY ASSURANCE

Contractor shall be responsible for the quality of all work of his forces and that of his subcontractors, for adherence to all laws and regulations, and for all public relations regarding the contract work, as set forth elsewhere in the Contract Documents.

1.03 SUBMITTALS

Shop drawings for all pipe and appurtenances shall be submitted pursuant to the requirements of the Contract Documents for Submittals, and shall show the materials, dimensions, stations and all relevant details.

1.04 PRODUCT DELIVERY

- A. Materials Furnished by the Contractor. Except as otherwise stated on the Bidding Sheet, all materials, including water pipe and appurtenances and service connections and appurtenances, shall be furnished in place by the Contractor, excepting service connection meters will not be furnished or installed by the Contractor. Materials to be furnished by the Contractor shall include that necessary for replacement of all obstructions, road surfacing, etc.

The Contractor shall furnish the Engineer, as soon as issued, duplicate copies of all orders placed outside the Contractor's plant for articles or materials to be furnished by the Contractor for incorporation in the work. The Contractor shall also furnish the Engineer with such additional information as reasonably may be required respecting the character of the material and progress of their procurement.

- B. Materials Furnished by the District. ONLY WHERE SHOWN ON THE CONTRACT DRAWINGS OR ON THE BIDDING SHEETS, OR ORDERED BY THE ENGINEER, the District will furnish any or all of the following materials necessary for the completion of the work under these specifications:

1. Cement mortar lined pipe, asbestos-cement pipe, ductile iron pipe, or PVC pipe with rubber gasket joints and gasket rings. Pipe will be delivered to the job site by the Pipe Supplier. Pipe to be unloaded and strung along trench site by Installation Contractor. Approximately 5% of each size of pipe will be furnished in the standard short lengths manufactured by the pipe supplier, except as otherwise requested by the Contractor.
2. Valves, flanges, gaskets, valve risers and caps, bolts, crosses, tees, bends, elbows, tapers, fire hydrant assemblies complete with valve and pipe, or air valve assemblies complete with piping and valves, etc.
3. Joint materials except for cement mortar.
4. Locating wire required for asbestos-cement pipe and PVC pipe systems.
5. Telemetry wire where noted on the construction drawings.

The Contractor shall, within seven (7) days after execution of the contract, meet with the Engineer for approval of his proposed schedule of construction and shall furnish the Engineer a written statement of the Contractor's requirements for delivery of materials and equipment to be furnished by the District with the dates upon which delivery of each class of said materials and equipment will be necessary in order to conform to the Contractor's program of construction.

Materials to be furnished by the District, except for pipe, will be delivered to the Contractor f.o.b. the Contractor's trucks at the District yard or warehouse, and the Contractor will sign for these materials received. No direct payment will be made to the Contractor for hauling or handling materials or equipment furnished by the District, but payment for such handling and hauling will be included in the prices named for the contract items wherein the materials and equipment are used. The Contractor shall be responsible for coordinating the delivery and the actual placement of all pipe in accordance with his requirements and construction schedule, shall properly barricade the pipe and other materials, and shall be responsible for any damage to property as a result of the unloading or placement of the pipe or other materials.

If the delivery of any materials or equipment specified herein to be furnished by the District shall be delayed by strikes, acts of God, or other causes beyond the control or without the fault or negligence of the District, the Contractor shall have no claim against the District for such delay in delivery, but shall be entitled to so much additional time wherein to perform and complete the contract on his part as the Engineer shall certify in writing to be just.

- C. Hauling and Handling Pipe. The Contractor shall protect all pipe from damage during hauling and handling. Dropping or bumping of pipe will not be permitted. Pipe will be handled with a two point pick-up with a six foot minimum spread. Slings or padded cable will be used so as not to damage exterior coating.

Pipe shall not be strung prior to blasting in those areas where blasting is required. Damaged pipe shall be replaced or repaired by the Contractor at his expense, and subject to approval by the Engineer.

1.05 JOB CONDITIONS

Water Furnished by District. The District will make water available for construction at the locations stated in the Special Provisions.

1.06 PAYMENT

- A. Measurement for Payment. Quantities for installation of pipelines and appurtenances on District-administered projects shall be measured for payment as specified herein and described on the Bidding Sheet:
1. Pipelines. Will be measured in place along the horizontal axis of the pipe by the linear foot, on the basis of pipeline completely installed and tested including earthwork, special bedding included in the work, pipe, gaskets, fittings, polyethylene encasement, specials, welding, concrete and miscellaneous materials. The measurement will be continuous through all valves and fittings.

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2. Valves. Will be measured on the basis of each gate valve or butterfly valve completely installed and tested including valve, valve riser and cap, earthwork and miscellaneous materials.
3. Air Valves. Will be measured on the basis of each air valve assembly completely installed and tested including tap-to main, piping, all valves, fittings, valve box, earthwork, and miscellaneous materials.
4. Fire Hydrants. Will be measured on the basis of each fire hydrant assembly completely installed and tested including tap-to-main, piping, valve, valve riser and cap, fittings, hydrant, earthwork and miscellaneous materials.
5. Blow-offs. Will be measured on the basis of each blow-off assembly completely installed and tested including tap-to-main, piping, valve, valve riser and cap, fittings, earthwork and miscellaneous materials.
6. Special Bedding. Will be measured on the basis of the cubic yards of special bedding required to bring the bedding up to grade for the trench size excavated up to the maximum size of trench allowable under these specifications. Only that special bedding for which there are stipulated costs, or for which special bid items are listed in the bid sheet will be measured for payment.

No allowance will be made for over-excavation except as directed by the Engineer, or for special bedding required in the contract work under other bid items.

7. Bore Casing. Will be measured on the basis of horizontal centerline distance and shall include all excavation, furnishing and placement of casing, furnishing and placement of all required back-packing and grouting around casing, backfilling within casing, pipe bracing, restoration of surfaces, and all labor and material for a finished job. Furnishing and installation of pipe within casing shall be included in pipeline measurement.
 8. Paving. Will be measured as a part of project causing removal and/or replacement of paving, except as otherwise specified on the Bidding Sheet.
- B. Payment. Payment for quantities for installation of pipeline and appurtenances on District-administered contracts will be paid for in the following manner. Quantities of items listed herein, measured as stated above and accepted, will be paid for at the unit bid prices as stated herein, which prices and payments shall constitute full compensation for furnishing all labor, equipment and tools necessary to complete the described work in place. No additional compensation will be paid above the unit bid prices for changes in quantities.

1. Pipelines. Quantities of pipelines will be paid for at the respective unit bid prices per horizontal linear foot for the kinds and sizes of pipe stated in the bidding sheet. Work includes all earthwork, installation and testing of pipe, specials, fittings, welding, anchors, removal and restoration of pavement, curbs, gutters and sidewalks, and clean-up. Payment for pipe in place shall be further broken down based upon the Contractor's submittal under Section F-10 of the General Conditions, as concurred by the Engineer, but not to exceed in the ordinary project the following percentages of the linear foot price stated on the Bidding Sheet:

Trench excavation	10%
Pipe laid in place and shaded.....	65%
Trench Backfilled and the Backfill Compacted.....	20%
Testing and Clean-up, Exclusive of Pavement Replacement	5%

2. Fittings and Specials. Payments for quantities of fittings and specials shall be included in the payment for installation of pipelines. Work includes installation of bends, tees, crosses, joint restrainers, couplings, saddles, outlets, tapers, butt straps and all necessary cuts and welding and all earthwork, and no additional compensation will be made therefore.
3. Valves. Quantities of gate valves or butterfly valves will be paid for at the respective unit bid prices for the size of valves stated in the bidding sheet. Work includes installation of valves, valve risers and caps, saddles, flanges, gaskets, bolts, and all earthwork.
4. Air Valves. Quantities of air valve assemblies will be paid for at the respective unit bid prices for the size of air valves stated in the bidding sheet. Work includes installation of tap-to-main, valves, service stops, elbows, bends, valve boxes, and all piping.
5. Fire Hydrants. Quantities of fire hydrant assemblies will be paid for at the respective unit bid prices for the sizes of fire hydrants stated in the bidding sheet. Work includes installation of tap-to-main, valves, valve risers and caps, saddles, bends, flanges, gaskets, bolts, hydrants, and all piping.
6. Blow-offs. Quantities of blow-off assemblies will be paid for at the respective unit bid prices for the sizes of blow-offs stated in the bidding sheet. Work includes installation of tap-to-main, valves, valve risers and caps, fittings, earthwork and miscellaneous materials.

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7. Special Bedding. Quantities of special bedding measured as stated above and accepted, will be paid for at the stipulated cost price, or the respective unit bid price for the quantities as stated in the bidding sheet, which price shall constitute full compensation for all labor, materials, and equipment necessary to complete the work in place, including the special bedding material.
8. Bore Casing. Payment for bore casing in place measured as stated above shall be made as specified on the bidding sheet.
9. Paving. Payment for quantities of paving measured as stated above and accepted shall be included in the unit bid for pipeline. Work includes removal and/or restoration of paving and all earthwork, and no additional compensation will be made therefore, except as otherwise provided on the bidding sheet.

1.07 GUARANTEE

All work, materials, and equipment shall be guaranteed for the periods of time set forth elsewhere in the contract documents for General Guaranty or Warranty.

PART 2 - PRODUCTS & MATERIALS

2.01 SERVICE CONNECTIONS

Service connections to asbestos-cement pipe main shall be by prefabricated heavy tapped couplings for 3/4", 1" & 1/2" Meter Service Connections. Service connections to ductile iron pipe and PVC pipe shall be made using service saddles.

2.02 FLANGE X HUB-END VALVES

Where valves do not connect to fittings, the fitting may be hub-end, or flange x hub-end. However, where valves connect to cast iron or welded steel fittings, fittings shall be flanged. Where flange x hub-end valves are not available for use with asbestos-cement pipe, flanged valves shall be used with flange x hub-end adaptors. All fittings and valves for ductile iron pipe and PVC pipe shall be bolted mechanical joint type.

All valves shall be hung plumb, with the stems vertical.

2.03 PORTLAND CEMENT CONCRETE

Cast-in-place structures of plain and reinforced concrete shall conform to the requirements of Chapter 26 of the Uniform Building Code and ACI 318, unless otherwise approved by the Engineer.

Classes of concrete used in the construction of cast-in-place structures shall be proportioned as specified in Section 03300 of the District standard specifications.

2.04 CEMENT MORTAR PIPE JOINTS

Mortared joints shall meet the following requirements:

A. Joint Mortar

1. Composition of mortar for caulking, buttering, or coating of joints shall be composed of cement, sand and water, well mixed and of such consistency as to produce a dense, homogeneous mortar that will adhere firmly to the pipe surface. Sufficient hand plastering of the joint prior to placing of the mortar is to be encouraged, to enhance the bond between the pipe and mortar.
 - a) Cement shall be Type V Portland Cement (sulfate resistant)
 - b) Water for mixing mortar shall be clean and free from mud, oil, organic material, or other deleterious substances.
 - c) Aggregate sand shall be silica sand passing at No. 16 mesh screen; or "plaster" sand at least 80% passing a No. 16 mesh screen; or other well graded inert, granular material produced from hard rock, with strong, durable, uncoated grains, upon prior approval of the District.
2. Proportions of cement and sand in joint mortar shall be one part of Portland cement to one and one-half parts of sand by volume. The exact proportion shall be determined by the characteristics of the sand used, and approved by the Engineer.
3. Water content shall be kept to the minimum allowing workability, as approved by the District, recognizing that better flow characteristics are required for placement in diapers around the pipe than for placement by caulking or buttering.
4. Mixing of the mortar should be long enough (approximately 3 minutes in paddle-type mixers, or 1 minute in turbine mixers) to obtain maximum plasticity. The mortar shall be used before initial set; therefore, only enough mortar shall be mixed at a time for immediate use even to the extent of discarding mortar already mixed in the event of delay in the pipelaying operation.

B. Diapers shall be impervious if available.

1. Width of diapers, where used, shall be sufficient to allow cupping of the diaper for increased thickness of the joint mortar. Recommended minimum diaper widths:

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20" dia. pipe and larger:.....	12"
12" - 18" dia. pipe:	10"
10" dia. pipe and smaller:	9"

2. Mortar placement shall be from one side of the diaper, to allow the mortar to flow around the bottom and up the opposite side of the pipe, to preclude the possibility of any voids inside the diaper.
- C. Curing operations shall begin immediately after completion of joint mortaring.
1. Immediate backfill should follow the completion of the joint mortaring operation where possible. Care must be taken to immediately wet down and consolidate the backfill, to avoid draining the moisture from the mortar through porous diapers into dry backfill soil, or disturbing the mortar set by subsequent compaction of the backfill.
 2. Completed-joint mortar to be exposed to the sunlight where backfill will not take place until after the mortar has hardened must be kept continually moist during the curing period to prevent cracking of the curing mortar.

2.05 LOCATOR WIRE

Locator wire shall be installed over all waterlines, reclaimed waterlines and forcemains whether or not telemetry wire is buried with pipe. Locator wire per Standard Drawing B-656 shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. Locator wire shall be brought to the surface at the edge of the right of way at 660 feet maximum on centers in Brooks No. 1-SP, or equal, valve boxes.

The valve boxes shall be placed within two feet of fire hydrants when fire hydrants are available at 660' or less on center. Where no fire hydrants are available, EMWD marker posts shall be installed within two feet of the valve boxes.

For subdivision construction, instead of the marker post, mark the face of the curb in front of the box with the letters "LW". Loop 2 feet of wire in valve box. Provide the inspector survey stations at each valve box for as-built drawings.

After all trench backfill operations are complete, the District shall pay for and conduct the locatibility test to confirm that the wire is continuous. The Contractor shall be responsible for all costs to confirm, locate and repair any breaks in the location wire identified in the locatibility test. In addition, the Contractor shall reimburse the District for all costs to retest repaired sections of the wire. The Contractor is advised to use care in the installation and backfilling operations to prevent damage to the wire.

2.06 TELEMETRY CABLE

On District-administered contracts, the District will supply the telemetry cable for installation in accordance with these specifications and contract drawings. The telemetry cable will be delivered to the Contractor at the District's warehouse. Prior to acceptance and delivery of the cable, a continuity test will be performed by District personnel or the Contractor's representative. Certification of the test results will be acknowledged by the Contractor or his representative in writing. The Contractor will be responsible for the safe handling, installation and retesting for total continuity of the cable installation prior to acceptance by the District.

2.07 POLYETHYLENE ENCASEMENT

All underground installed valves, ductile iron pipe and fittings shall be polyethylene encased at the time of installation. Polyethylene encasement and installation shall be in accordance with ANSI/AWWA C105/A21.5.

2.08 JOINT BONDS

All metallic pipes shall be electrically continuous except at insulating flanges. All joints that are not welded shall have bonds to ensure continuity.

Cathodic test stations and/or Insulated Test Connection 4-wire test stations shall be installed at every half mile or less except where otherwise indicated on the plans.

2.09 DROPS AND SIPHONS

All waterline drops and siphons larger than 12" shall be CML&C. A soil corrosivity report with recommendations shall be prepared by a corrosion engineer and submitted to the District for approval prior to construction.

PART 3 - EXECUTION

3.01 GENERAL

It shall be the responsibility of the Contractor, prior to start of construction, to meet with the Engineer:

- A. For approval of schedule of construction for work and completion of pipelines or sections thereof.
- B. To submit the required forms listed in the General Conditions.
- C. To coordinate delivery of District-furnished materials.
 1. Determine location and placing of the pipe to be unloaded and direction of placing bells;
 2. Determine the quantity of pipe to be placed in a particular location;
 3. Coordinate delivery of pipe and other materials to meet his construction schedule.

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- D. To furnish such additional information as may be required from time to time as construction progresses, regarding the progress of the procurement and delivery of the required equipment and materials, and/or the scheduling of the work.

Any subsequent shuttling of pipe, turning of bells, etc., will be at the Contractor's expense and no additional compensation will be allowed above the unit bid price, unless authorized by the Engineer in writing. All quantities shown on the Bidding Sheet and the contract drawings indicate the estimated quantities of materials for the completed pipelines in place.

3.02 BEDDING PIPE

- A. General. Each section of pipe shall be lowered into the trench in a manner that will prevent injury to the pipe, coating, or joints and shall be carefully bedded to provide continuous bearing and prevent uneven settlement. The inside of the pipe shall be clean and free from foreign material of any kind before being installed.
- B. Steel Pipe. For bedding steel pipe without encasement, the trench bottom shall be given a final trim such that each pipe section first laid will be continuously in contact with the ground along the bottom as shown on the drawings, provided that in the event ground is encountered which, due to its instability or other properties, but through no fault of the Contractor, cannot be trimmed in the prescribed manner or made to retain the specified shape, a 2-inch bedding or other suitable modification of the method of bedding the pipe will be ordered by the Engineer. Bellholes will be provided to prevent bridging the pipe supported at the bells.

Wherever, due to over-excavation or inaccurate trimming by carelessness in the operation of the Contractor's equipment or by his workmen, the shaping is inadequate to afford uniform support for the normal bedding of the pipe, the Contractor at his own expense, shall refill with sand, consolidate, and then reshape the trench bottom to the required section.

Pipe zone bedding shall be completed in accordance with the requirements of the District standards and/or the manufacturer's trench section bid submittal.

- C. Asbestos-Cement Pipe. Asbestos-cement pipe without encasement shall be installed in accordance with AWWA Spec. C603, shall be bedded in accordance with Section 3.2 of that specification for pipe laid on earth mounds, and in accordance with the standard drawings.
- D. Ductile Iron Pipe. Ductile iron pipe without encasement shall be installed in accordance with AWWA Spec. C600.

- E. PVC Pipe. PVC pipe without encasement shall be installed in accordance with ASTM D-2774-82.

For PVC pipe and ductile iron pipe with mechanical joints, the gasket shall be placed in the groove of the bell. Lubricate the spigot lead of the pipe, keeping it clean and free of dirt or sand and then insert the spigot end into the bell and force into position per manufacturer's recommendation.

- F. Tolerance. The pipe shall be accurately laid to alignment and grade shown on the drawings or established by the Engineer. Where grade stakes are provided with which to establish the proper pipeline grade, pipe shall be laid to grade within a tolerance of 0.1', or 0.2' cumulative deviation from elevations set by adjacent grade stakes. As ordered by the Engineer, the allowed tolerance may be greater than herein indicated for lines on steep grades, or less than herein indicated for the larger lines or lines on flat grades, where necessary to avoid air pockets.

3.03 RUBBER GASKET PIPE JOINTS

After the subgrade has been prepared as specified, the rubber gasket shall be placed in the groove on the spigot ring, and the spigot end of the pipe then entered into the bell of the adjoining pipe and forced into position. Care shall be taken to avoid twisting or cutting the gasket when jointing the pipe. The inside surface of the bell shall be lubricated with a compound of Sherwin-Williams Fluxsoap or approved equal which will facilitate the telescoping of the joint.

- A. Lining. For steel pipe smaller than 21 inches, buttering of joints with cement mortar and drawing sewer ball or an approved swab or squeegee through the pipe may be substituted in place of caulking and troweling. Water shall not be turned into the pipe until the inside joints have been properly cured.
- B. Coating. In the case of wrapped steel pipe, the outside joints shall be completely primed with Primer 1170 and wrapped with Protecto-Wrap.

In case of cement mortar coated steel pipe, the outside joints shall be completely coated with cement mortar using diapers as set forth in Article 2.04, Cement Mortar Pipe Joints.

All field coatings other than joint mortar shall be shaded with pipe zone backfill after their initial set, but prior to four (4) hours following installation, and properly protected during the shading operation. Joint mortar shall be cured as set forth in Article 2.04, Cement Mortar Pipe Joints.

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3.04 CURVES, ANGLES, CLOSURES AND SHORT SECTIONS

The laying of pipe on curved alignment by means of unsymmetrical closure of spigot into bell rings will be permitted. The amount of pull permitted from normal closure on one side of the joint will be up to 1/2" for 8" pipe or smaller, up to 3/4" for 10" through 21" pipe, and up to 1" for pipe 24" and larger; provided that the maximum deflection shall not exceed the manufacturer's recommendation. Where smaller radius of curvature is required, sections of pipe with beveled ends may be fabricated for the purpose and laid on curved alignment, unless fabricated bends are shown on the drawings or ordered by the Engineer. Beveled pipe may have a maximum bevel of five degrees measured from a plane perpendicular to the pipe's axis. The center of the short side of the bevel shall be marked on the joint bands. For the purpose of reducing the angular deflections at pipe joints and for closure sections, the Contractor shall be permitted to install pipe sections of less than standard length. Where such installations are allowed, Contractor shall be responsible for anchorage of the necessary joints, as directed by the Engineer. Curved Sections of PVC pipe shall be in accordance with AWWA C-900 and manufacturer's recommendations.

Closing courses and short sections of straight pipe shall be fabricated and installed by the Contractor as found necessary in the field and approved. Where closing pieces are required, the Contractor shall make all necessary measurements and shall be responsible for the correctness. Other than closing courses and short sections approved by the Engineer for field fabrication, all pipe and special fittings shall be fabricated in a shop approved by the Engineer for that purpose.

Asbestos-cement pipe cutting or beveling operations shall utilize tools that do not produce concentrations of airborne asbestos dust exceeding levels permitted by regulatory agencies.

PVC pipe shall be cut square, deburred and beveled in accordance with pipe manufacturer's recommendations. The pipe shall be cut in a neat and workmanlike manner without damage to the pipe.

3.05 WELDING

The Contractor shall be responsible for the quality of work performed by his welding organization. All welding operators shall be qualified under the Standard Qualification procedure of the American Welding Society. All welds shall be made by an electric shielded arc method of welding. When continuous welded pipe is specified, the Contractor shall use filler rods made of the same material as the cans, per the manufacturer's recommendations. No bending of the pipe shall be allowed.

All pipe welds at joints and fittings shall be double pass full welds. Welding shall be performed only after any mortar within two (2) feet has a 24-hour set.

The Engineer shall have the right at any time to call for and witness the making of test specimens by any welder in accordance with these specifications, and the expense of such tests shall be borne by the Contractor.

Welds considered by the Engineer to be deficient in quality, or made contrary to any mandatory provision of these specifications, shall be removed by chipping or melting, and shall be remade. The weld-metal shall be removed throughout its depth to expose clean base metal, but in case of a strictly local deficiency, the weld need not be removed throughout its entire length, provided that a sufficient amount shall be removed to insure that sound weld metal only remains. A cracked weld shall be removed throughout its length.

3.06 JOINT INSPECTION

For sizes smaller than 30 inch, Contractor must provide closed circuit television inspection (CCTV) as a post-construction method to determine if the pipeline has been installed as required and all joints have been properly finished. CCTV system shall have a rotating lens camera with articulating head. Each joint will be scanned 360 degrees. The television camera shall be specifically designed and constructed for water pipe inspection. The camera shall be operative in 100% humidity conditions. Lighting for the camera shall minimize relative glare. Lighting and camera quality shall be suitable to provide a clear, in focus picture of the entire periphery of the water pipe for all conditions encountered during the work. Focal distance shall be adjustable through a range from 6" to infinity. The remote reading footage counter shall be accurate to one percent (1%) over the length of the particular section being inspected. The camera, television monitor and other components of the color video system shall be capable of producing a minimum of 350 line resolution. Documentation consisting of a color video tape and a written report detailing the condition of the mainline and joints shall be submitted to EMWD for approval prior to pressure testing.

Any defects in the pipe lining or joints, shall be repaired and another video taken of the repaired section and submitted for approval by EMWD prior to pressure testing. **For domestic water systems, all video equipment must be certified for DOMESTIC WATER LINE INSPECTION ONLY, and NEVER to have been utilized in a non-potable system.**

3.07 FIRE HYDRANT RUNS

In asbestos-cement pipe, ductile iron pipe, and PVC pipe systems where thrust blocks are required, trenches shall be trimmed neat to avoid encroachment of the thrust block into the area of future utility trench assignment.

3.08 FLANGE, FITTING AND BOLT CORROSION PROTECTION

All corporation stops, valves and other appurtenances and fittings at the pipeline shall be primed, and wrapped with Protecto-Wrap No. 200 or 300 Coal Tar Resin tape. Bolts and nuts shall be protected using zinc caps anodes in accordance with section 15089.

Fittings and valves on pipeline shall be encased in alkalized sandslurry envelope between 12" and 18" thick. Composition 50 lb. hydrated lime per cubic yard of sand.

All bare iron and steel shall be field coated with one of the following as directed by the Engineer:

- A. Protecto-Wrap #1170 primer and #200 or #300 Coal Tar Resin tape; or

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- B. two coats of Koppers Supertank solution; or
- C. cement mortar meeting the requirements of Article 2.04.

3.09 VALVE CAP AND RISER INSTALLATION

In new subdivision developments, Contractor shall leave valve cans 3" minimum below rough-graded subgrade street surface, properly covered, and shall return after paving of the streets is completed by others, to raise the valve slip can and cap to grade. Contractor shall coordinate his work with that of the paving contractor to place the slip can during placement of the road sub-base, if desirable.

3.10 SERVICE CONNECTION METER BOX LOCATIONS AND METER INSTALLATION

Service connections shall be installed by the Contractor of the size and at the locations shown on the standard drawings, with meter boxes located as shown on the standard drawing for the proper size meter service connection. Where meter installation is indicated on the standard drawings, spacers as shown on the standard drawings shall be furnished and installed by the Contractor for later installation of meters to be furnished and installed by the District.

Except as specifically stated otherwise, or as coordinated by the Engineer upon mutual agreement during construction, meter boxes shall be set after curbs have been constructed in those areas involving curb construction in the street improvement, and after grading of the parkway or road shoulders. The Contractor shall maintain the meter boxes within County road improvements until those improvements are accepted by the County.

3.11 SERVICE CONNECTIONS

Service connections to asbestos-cement pipe shall utilize heavy tapped couplings where service connections are made or locations are known at the time of main installation. Service connections to ductile iron pipe and PVC pipe shall utilize service saddles. Water Service Compression Couplings where required or permitted, shall utilize a stainless steel insert in accordance with the drawings. The stainless insert specified shall be a full circle insert; split or collapsible inserts will not be accepted.

3.12 ELECTROLYSIS FACILITIES

Such as insulating flanges, test connection stations, and bonding of pipe joints shall be installed to eliminate conductivity of electrical current or to ensure such conductivity, whichever is appropriate. Inasmuch as the testing of these installations requires specialized equipment, any tests required by the Engineer will be performed by the District or its agent at District expense on District-administered contracts. The electrical potential and current necessary to successfully test the installation shall be determined by the District or its agent for each individual facility, dependent upon such factors as the pipe-to-soil potentials available.

3.13 TEMPORARY BUMPHEADS

The Contractor shall furnish and install complete, all the necessary temporary bumpheads or skillets and appurtenances thereto in the pipeline used for backfilling or testing purposes and shall remove such bumpheads upon completion of the line.

The Contractor shall furnish, at his own expense, any openings in the pipeline or bumphead and any valves or by-pass arrangements which are for his convenience in filling, testing and/or emptying the pipeline.

At all times when the work of installing pipe is not in progress, all openings into the pipe and the ends of the pipe in the trench shall be tightly closed to prevent entrance of animals and foreign materials.

The Contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source, shall assume full responsibility for any damage due to this cause and shall at his own expense restore and replace the pipe to its specified condition and grade if it is displaced due to floating.

If the Contractor, upon approval by the Engineer, elects to test a system utilizing valves and connecting pipe installed by the District, the District will assume responsibility for any leaks occurring in any pipeline or valve furnished and installed by the District. In the event Contractor is unable to satisfactorily test his system because of leaks in the District-installed system, Contractor shall install temporary bumpheads in his construction to perform tests, as determined necessary by the Engineer. Full compensation for furnishing all labor, tools, materials, and equipment (except water when provided by the District), and for doing all work involved in testing, and for repairing any leaks shall be included in the price paid for installation of the pipe, and no additional compensation by the District will be allowed therefore.

3.14 FIELD HYDROSTATIC TEST

Upon completion of the laying, jointing, backfilling, and proper curing of the joints, and compaction of backfill, the pipeline or portions thereof shall be hydrostatically tested.

For convenience of testing, the pipeline may be divided into sections and each section tested separately. Main line valves may be used in lieu of special bumpheads, or if valves are not conveniently located, temporary bumpheads shall be constructed. Bumpheads shall be constructed to safely withstand the hydraulic pressures imposed upon them. No payment will be made expressly for the work and materials required for the bumpheads and any compensation desired by the Contractor for this work shall be included in the price quoted for the installation of pipe. The Contractor shall have no claim against the District by reason of required construction of bumpheads due to the omission of the installation of any or all main line valves.

After the section of pipeline has been bumpheaded and completely filled with water, it shall be allowed to stand under pressure a sufficient time to allow the pipe to obtain a maximum absorption of water and to allow the escape of air from any air pockets. The pressure shall then be increased to the specified test pressure as hereinafter described, and shall be maintained at this pressure for not less than four (4) hours.

All pipes shall be tested under a pressure 1 1/2 times the pressure rating of the pipe, but not less than 150 pounds per square inch. Maximum test pressure shall not exceed 225 pounds per square inch unless otherwise specified by the Engineer.

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As a matter of information, valves specified elsewhere for installation shall meet the following conditions:

Gate Valves

AWWA C-500 requires:

12" & smaller: 200 psig rated working pressure

16" & larger: 150 psig rated working pressure

At these pressures, allowable hydrostatic leakage rate is
1 fl. oz./hour/inch of nominal valve size.

Butterfly Valves

AWWA C-504 requires:

3" - 72": 150 psi working pressure

Allowable leakage:

Drip-tight at 150 psi hydrostatic pressure differential

Dresser 450 [AWWA Class 150-B (150 psi)]

4" - 12": 200 psi rated working pressure

14" & larger: 150 psi rated working pressure

Allowable leakage:

Bottle tight at rated working pressure differential

If testing is against gate valves and leakage is detected through the valve, additional leakage over and above the allowable leakage for the pipeline may be allowed at the rate of 1 fl. oz./hour/inch of valve diameter. There will be no allowance for leakage through butterfly valve.

If any leakage is evidenced in the testing of the pipeline, the various sections of the pipeline shall be isolated for testing between available valves, or between bumpheads located as directed by the Engineer. The maximum allowable leakage for asbestos-cement pipe shall be ten (10) gallons per day per mile of pipe per inch of pipe inside diameter. The maximum allowable leakage for steel pipe shall be two (2) gallons per day per mile of pipe per inch of pipe inside diameter. The maximum allowable leakage for ductile iron pipe shall be seven (7) gallons per day per mile of pipe per inch of pipe inside diameter. The maximum allowable for PVC pipe shall be six (6) gallons per day per mile of pipe per inch of pipe inside diameter. If the leakage exceeds this amount, the section being tested will be considered defective. The Contractor shall determine the points of leakage, make the necessary repairs and perform another test. This procedure shall be continued until the leakage in each section falls below the allowable maximum for that section of pipeline.

Leakage shall be determined by metering the water injected into the pipeline while under the required pressure. The Contractor shall submit to the District before and after the test the gage and meter used so that these devices may be tested by this District.

The Contractor shall provide all calibrated meters for measurement of leakage, all bumpheads or skillets, piping, calibrated gages, pumps and other equipment, all water not furnished by the District, and all power and labor necessary for the performance of pressure tests satisfactory to the Engineer. The Contractor shall furnish all necessary equipment and labor to fill each section of pipeline tested and for pumping the water from one test section to another as may be necessary for obtaining and maintaining the required water pressure and for filling the entire pipeline with water after the conclusion of the testing, as hereinafter provided.

The Contractor, at his own expense, shall do any excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed, shall replace such excavated material, and shall make all repairs necessary to meet the required water tightness after which the test shall be repeated until the pipe meets the test requirements. All tests shall be made in the presence of the Engineer. After the pipe has met successfully all test requirements specified herein, the entire pipeline shall be filled with water and so maintained until the completion of the contract unless otherwise ordered by the Engineer.

3.15 CHLORINATION

- A. Flushing. Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a tap should be provided large enough to develop a velocity of at least two and five-tenths (2.5) feet per second in the main. A two and one-half (2½) inch hydrant opening will, under normal pressures, provide this velocity in pipe sizes up to and including twelve (12) inch.

All taps required for chlorination, flushing purposes, or for temporary or permanent release of air shall be provided for by the CONTRACTOR as a part of the construction of water mains.

- B. Requirement of Chlorine. Before being placed into service, all new mains and repaired portions of, or extension to existing mains shall be chlorinated so that the initial chlorine residual is not less than 50 mg/l and that a chlorine residual of not less than twenty-five (25 mg/l) remains in the water after standing twenty-four (24) hours in the pipe.
- C. Form of Applied Chlorine. Chlorine shall be applied by one of the methods which follow subject to approval by the ENGINEER.
1. Liquid Chlorine. A Chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device, or the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas, or the gas itself, must provide means for preventing the backflow of water into the chlorine.

2. Chlorine-Bearing Compounds in Water. A mixture of water and high-test calcium hypochlorite (65-70% Chlorine) may be substituted for the chlorine gas water mixture. The dry powder shall first be mixed as a paste and then thinned to a one (1) percent chlorine solution by adding water to give a total quantity of seven and five-tenths (7.5) gallons of water per pound of dry powder. This solution shall be injected in one end of the section of main to be disinfected while filling the main with water in the amounts as shown in the table which follows:

Chlorine Requirements to Produce 50 mg/l
Concentration in 100 Foot of Pipe - By Diameter

<u>Pipe Size Inches</u>	<u>100% Chlorine Chlorine, LB.</u>	<u>1% Chlorine Solution, Gals.</u>
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

3. Tablet Disinfection. Tablet disinfection is best suited to short extensions (up to 2500 ft.) and smaller diameter mains (up to 12 inch). Since preliminary flushing must be eliminated in using this method, it should be utilized only when scrupulous cleanliness has been used in construction. It should not be used if trench water or foreign material has entered the main or if the water is below 41 F.

Tablets should be placed in each section of pipe, hydrants, hydrant branches, and other appurtenances. Tablets must be at the top of the main and shall be attached by an adhesive, such as Permatex No. 1 or any alternative approved by the ENGINEER. Tablets in joints between pipe sections, hydrants, hydrant branches, or appurtenances are to be crushed and placed inside the annular space, rubbed like chalk in butt ends of sections to coat them if the type of assembly does not permit crushing.

In filling a section of piping with water when using the tablet method, water velocity shall be less than one (1) foot per second.

Number of 5-Grain Hypochlorite Tablets Required
for a Dosage of 50 MG/L per Length of Pipe Section

<u>Pipe Size Inches</u>	Length of Pipe Section -----Foot----->				
	<u>Up to 13</u>	<u>18</u>	<u>20</u>	<u>30</u>	<u>40</u>
2	1	1	1	1	1
4	1	1	2	2	2
6	2	2	3	3	4
10	3	5	7	7	9
12	5	6	10	10	14

- D. Point of Application. The preferred point of application of the chlorinating agent is at the beginning of the pipe line extension or any valved section of it, and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipe line extension. Alternate points of application may be used when approved or directed by the ENGINEER.

- E. Preventing Reverse Flow. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves may be used if desired.

- F. Retention Period. Treated water shall be retained in the pipe at least twenty-four (24) hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least twenty-five (25) mg/l.

- G. Chlorinating Valves and Hydrants. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent and under normal operating pressure.

- H. Final Flushing and Testing. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its lengths shows upon test, a chlorine residual of less than one (1) mg/l. In the event chlorine is normally used in the source of supply, then the tests shall show a residual of not in excess of that carried in the system.

After flushing, water samples collected on two (2) successive days from the treated piping system, as directed by the ENGINEER, shall show satisfactory bacteriological results.

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A minimum of one sample shall be taken from the end of the new main and one from each branch of the new main. If the new main is extremely long, then samples shall be collected along the length of the line as well as at its end. If trench water has entered the main during construction, or if excessive quantities of dirt or debris have entered the main, then bacteriological samples shall be taken every 200 feet at 24 hours after the final flush.

Each sample will be subjected to the MMO-MUG or approved method and Heterotrophic Plate Count.

If total and/or fecal coliform bacteria are present, then the sample fails and corrective action shall be performed, and a re-sample submitted.

If an HPC of greater than 500 colony forming units is found, then the sample fails State and Federal regulations.

For both the re-sample, and the replacement sample, it may be recommended that upstream and downstream samples are taken to eliminate the possibility of a poor sampling site. (Another way to eliminate a poor sampling site is to request that the contractor install a sampling station or a sampling spigot.) It may also be recommended that a source sample is obtained. This sample will be taken outside the influence of the main being tested, and labeled "source".

Bacteriological analysis must be performed by a laboratory certified by the California Department of Public Health.

- I. Repetition of Flushing and Testing. Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the CONTRACTOR until satisfactory results are obtained.

3.16 PIPE ENTRY RESTRICTIONS

No person shall enter a pipe that has not been checked for hazardous gases and oxygen concentration. Incapacitated persons in the pipe shall be practically accessible for rescue within five minutes.

The Contractor shall adhere to all the installation recommendations of the pipe manufacturer including any requirements for bedding and backfill before stull removal and joint mortar. The recommendations of the manufacturer shall be included in the prices bid for installation.

END OF SECTION 02718

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SPECIFICATIONS - DETAILED PROVISIONS
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**SECTION 02725
INSTALLATION OF COPPER PIPE AND TUBING**

PART 1 - GENERAL

1.01 DESCRIPTION

All copper tubing, exposed, buried, or in plastic conduit, shall conform to ASTM Specification B-88 and shall be Type K soft-annealed.

Fittings shall be solder type forged or wrought copper. Solder shall be ASTM B 32-70 alloy, Grade 5A.

Flange fitting connections up to 7/16" diameter may be used when approved by the Engineer. Such fittings shall be brass conforming to ANSI/ASME pressure rated pipe for maximum working pressure of 7,000 p.s.i.

Copper pipe connected to hydraulic cylinders, steel or iron valves, galvanized steel pipe, black steel pipe, stainless steel pipe, Venturi tubes, or other non-copper items shall be connected by means of dielectric insulating unions or fittings as manufactured by the Patrol Valve Company, Mueller Company, or equal.

When making connections to meters or other devices having female or male threaded fittings, special thread-to-tube adapters shall be used. Such adapters shall be equal to Crawford Fitting Company "Swagelok" brass tube fittings.

Copper pipe and tubing shall be manufactured by Anaconda, Phelps-Dodge or Revere.

PART 2 - EXECUTION

2.01 EXECUTION

All installations shall conform to the requirements of the Uniform Plumbing Code (latest edition). Copper tubing embedded in concrete shall be protected by double-coverage protective wrap with a minimum of 20 mil thickness material. In no case, shall piping be in direct contact with concrete or masonry walls or footings. Copper lines shall be neatly supported at such intervals as to prevent sagging. Tube shall be cut square with hacksaw or disc cutter and shall be reamed full size and burrs removed. If necessary, a sizing tool shall be used to correct any distortion. The outside surface of the end of the pipe and the inside surface of fittings shall be cleaned with steel wool until the metal is bright. Soldering flux shall be applied to the cleaned surfaces of pipe and fitting in a thin, uniform, complete coating. After the pipe has been inserted in the fitting as far as it will go, fitting shall be twisted on the pipe to help spread the flux uniformly. The fitting shall then be heated until it reaches the correct temperature to melt the solder.

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END OF SECTION 02725

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SPECIFICATIONS - DETAILED PROVISIONS
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**SECTION 03300
CAST-IN-PLACE CONCRETE**

PART 1 - GENERAL

1.01 DESCRIPTION

Provide cast-in-place concrete work, complete as indicated, specified and required, including all appurtenant work as indicated.

A. Work Included in This Section. Principal items are:

1. All cast-in-place concrete including bases for mechanical and electrical equipment.
2. Concrete standards, materials, mixes and tests, placement, finishing, patching, grouting, and crack repair.
3. Embedded waterstops for cast-in-place concrete.
4. Concrete curing.
5. Sealing of joints in liquid-containing structures and elsewhere shown.
6. Treatment of concrete surfaces.

B. Related Work Not Included in This Section:

1. Formwork (Section 03150).
2. Reinforcing work (Section 03200).
3. Concrete Unit Masonry (Section 04220).
4. Architectural finishing
5. Sealers, coatings, and waterproofing for treating concrete surfaces.
6. Pre-stressed concrete.

C. Definitions:

1. Water-Bearing Structure shall be construed to mean any structure any part of which contains water or process liquids, or which protects spaces from groundwater.

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2. Definitions of surface treatments of concrete structures:

Waterproofing. The Division 7 material to be applied, or the application of Division 7 material, to either earth-supporting below-grade surfaces or water-bearing surfaces of either existing or new walls common to occupied areas (i.e. galleries, pump rooms, etc.), for the purpose of making such walls impervious to water or sewage.

Damp-proofing. The Division 7 material to be applied, or the application of Division 7 material to either earth-supporting below-grade surfaces or water-bearing surfaces of either existing or new walls common to occupied areas (i.e. galleries, pump rooms, etc.), for the purpose of retarding the passage or absorption of water or water vapor. An alternate specified method of damp-proofing might be the addition of a suitable admixture or treated cement to the concrete.

Coating. The Division 9 material or system, or application of Division 9 material or system, to protect or paint concrete surfaces.

Sealer. A coating applied to seal the pores in an uncoated surface.

The sealer for surfaces to be painted in the prime or first coat of a Division 9 painting system.

The sealer for surfaces to be left unpainted is a clear transparent waterproof coating.

Seal Coat. A layer of Division 2 bituminous material applied to seal the concrete surface.

Sealant or Sealing Compound. A Division 7 impervious material for the purpose of excluding water by sealing or caulking joints in water-bearing surfaces or traffic surfaces, for the purpose of excluding moisture or sound by sealing or caulking joints in surfaces or partitions, or for the purpose of providing a bond breaker.

1.02 REFERENCE STANDARDS

Except herein modified, concrete work shall conform to the latest requirements/edition of ACI 301, Specifications for Structural Concrete for Buildings, and to requirements of ACI Standards and ACI Recommended Practices as contained therein.

1.03 SOURCE QUALITY CONTROL

- A. Code Requirements. Unless more stringent requirements are specified herein and/or shown on the Drawings, all work shall conform to the applicable requirements of the Uniform Building Code, latest edition.

- B. Testing. Materials shall be tested as hereinafter specified and unless specified otherwise all sampling and testing shall be performed by District approved Testing Laboratory with cost borne by the Contractor.
1. Portland Cement. Submit notarized Mill Certificates, provided by the cement manufacturer, including full compliance with requirements specified. In the absence of certificates, Testing Laboratory shall perform tests for each 250 barrels of cement at Contractor's expense, tests made in accordance with ASTM C150 with tensile strength test made at 7 days. Cement shall be tagged for identification at location of sampling.
 2. Stone Aggregate for Concrete. Test aggregate before and after concrete mix is established and whenever character or source of material is changed. Include a sieve analysis to determine conformity with limits of gradation. In accordance with ASTM C75, take samples of aggregates at source of supply or at the ready-mix concrete plant. Submit certified test results.
 - a) Sieve Analysis. ASTM C136.
 - b) Organic Impurities. ASTM C40. Fine aggregate shall develop a color not darker than reference standard color.
 - c) Soundness. ASTM C88. Loss resulting therefrom, after 5 cycles, shall not exceed 8% of coarse aggregate, 10% for fine aggregate.
 - d) Abrasion of Concrete Aggregate. ASTM C131; loss shall not exceed 10% after 100 revolutions, 42% after 500 revolutions.
 - e) Deleterious Materials. ASTM C33.
 - f) Materials Finer Than 200 Sieve. ASTM C117; not to exceed 1% for gravel, 1.5% for crushed aggregate per ASTM C33.
 - g) Reactivity Potential. ASTM C289. Ratio of silica released to reduction in alkalinity shall not exceed 1.0.
 - h) Cleanliness and Sand Equivalent. For all aggregate, not less than 75 for average of 3 samples tested according to Test Method No. California 217E (Materials Manual, Testing and Control Procedures - Materials and Research Department, State of California).
- C. Applicator. The applicator of waterproofing, damp-proofing, coatings, sealers, seal coats, or sealants shall be approved by the manufacturer of the material.

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1.04 CONCRETE MIX DESIGNS AND PRELIMINARY TESTS

At Contractor's expense, Testing Laboratory shall prepare mix designs for all cast-in-place concrete to have the required 28-day compressive strengths, and shall perform preliminary testing in accordance with the following requirements. Test results shall be submitted to the District. **Contractor may furnish EMWD mixes in Part 2.02 in lieu of trial batches where appropriate.**

A. Mix Designs

1. Strength Requirements. Design concrete mixes for use in various locations, for minimum 28-day compressive strengths and maximum aggregate sizes required by Structural Drawings and these Specifications, as follows, except as otherwise specified in the Special Conditions:
 - a) Class "AA", 4,000 psi Concrete. Class "AA" concrete shall be provided throughout except as specified hereinafter, or in the Special Conditions.
 - b) Class "A", 3,000 psi Concrete. Standard Specifications for Public work Construction Class 560-C-3250, 3250 psi concrete. Class "A" 3,000 psi concrete or Class 560-C-3250 shall be provided for concrete used in:
 - (i) all reinforced concrete, interior and exterior, not otherwise specified;
 - (ii) anchors and anchor walls;
 - (iii) pipe cradles, encasements, and beam supports;
 - (iv) reinforced valve supports;
 - (v) concrete for grout topping (with reduced-sized aggregate as directed);
 - (vi) paving;
 - (vii) sewer manhole bases and collars;
 - (viii) sewer tree lateral clean-out supports;
 - (ix) sewer chimney lateral supports.
 - c) Riverside County Class "B", 3,000 psi Concrete. Riverside County Class "B" concrete shall be provided for non-reinforced concrete used in the following:
 - (i) Non-machine laid curbs and gutters
 - (ii) Spandrels
 - (iii) Driveways and approaches
 - (iv) Sidewalks
 - (v) Exterior slabs
 - (vi) Stairs on grade

- d) Riverside County "B", 3000 psi Machine Laid Concrete. Riverside County Class "B" machine laid concrete shall be provided for non-reinforced concrete use in the following:
- (i) Machine laid curbs and gutters
- e) Class "B", 2,500 psi Concrete. Class "B" concrete shall be provided for non-reinforced concrete used in:
- (i) sewer overflow encasements;
 - (ii) sewer lateral joint encasements;
 - (iii) pipe joint mortar;
 - (iv) fence post footings;
 - (v) non-reinforced cut-off walls;
- f) Class "C", 2,000 psi Concrete. Class "C" concrete shall be provided for concrete used in:
- (i) non-reinforced thrust blocks and pipe pads;
 - (ii) valve supports;
 - (iii) sewer clean-out supports not otherwise specified.
 - (iv) Buried Electrical (See G).
- g) Class "D" Concrete, strength and use as specified.
- (i) Basis for Mix Designs. Design concrete mixes for workability of mix and durability of concrete. Concrete mixes shall be rigidly controlled in accordance with laboratory trial batch method or combinations of materials previously evaluated as required by Sections 5.3, respectively, Standard Building Code Requirements for Reinforced Concrete (ACI 318, latest edition), of the American Concrete Institute and to satisfy herein specified concrete strength requirements. When, in the opinion of the Engineer, it becomes necessary to increase the cement content to gain the required strength, such adjustment shall be made at the Contractor's expense.
 - (ii) Water/Cement Ratios. Mixes for normal weight aggregate concrete shall be designed within the following maximum water/cement ratios when concrete is to be used in the various locations:
 - For 4,000 psi water-bearing structural concrete limit water/cement ratios by weight as follows:

Freshwater-bearing structures	0.48 maximum
Sewage-bearing structures	0.45 maximum

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- For all other concrete, water/cement ratios shall be no greater than 0.53, except EMWD mixes and Riverside County mixes listed in Section 2.02.
- B. Preliminary Strength Tests. In laboratory, prepare nine (9) compression test cylinders for each concrete mix design (unless more tests are required for an earlier age). Fabricate and cure cylinders in accordance with ASTM C31. Use concrete, aggregates and admixtures proposed for the concrete work. In accordance with ASTM C39, test three sets of two cylinders at 28-day age. For each mix, no individual strength test result shall fall below the required f'_c .
- C. Drying Shrinkage Tests. For each mix design used for preliminary strength tests, using same concrete materials including admixtures, prepare three (3) test specimens for drying shrinkage testing. Specimens shall be 4 inch by 4 inch by 11 inch prisms fabricated, cured, and tested in accordance with ASTM C157, using 10 inch effective gauge length. Measurements shall be taken at one (1) day, seven (7) days, fourteen (14) days and twenty-one (21) days of curing. Zero measurement shall be the one day reading when determining shrinkage. The measurements after 7, 14, and 21 days of drying shall be taken and reported separately. The average drying shrinkage of each set of test specimens after two (2) days of drying shall not exceed 0.036% for concrete in all portions of water-bearing structures and not exceed 0.05% for all other structural concrete, except concrete for footings, piles and pile caps will not require drying shrinkage tests. Single specimens shall be within a tolerance of 25% of said maximum percentage.
- D. Reports. File three (3) copies of each mix design, preliminary strength test report, and drying shrinkage test report with District for review and approval. Contractor shall submit a letter of certification by an approved testing laboratory that the concrete materials, mixes, properties, and work conform to the requirements indicated and specified.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

Deliver materials in a timely manner to insure uninterrupted progress of work. Store materials in a manner that will preclude damage and permit ready access for inspection and identification.

- A. Materials for treatment of concrete surfaces. The contractor shall deliver sealers, coatings, waterproofing, or other surface treatment materials to the site in their original, unopened containers with the manufacturer's labels intact, describing contents and manufacturer.

Stored materials shall be kept covered and precautions shall be taken for the prevention of fire. Empty containers and soiled or oily rags shall be removed from the site at the end of each day's work.

1.06 PAYMENT

Payment for cast-in-place concrete shall be based upon concrete poured and found acceptable upon the removal of forms and performance of required finishing. Under no conditions will more than 90% payment be made for concrete formed and poured until required finishing is completed.

On large structures requiring construction over multiple payment periods, consideration may be given by the Engineer for payment as follows:

- A. Forms and rebar in place and accepted for concrete pour - 50% maximum of concrete price per cubic yard.
- B. Concrete poured and forms stripped, and found acceptable to the stage of construction - 35% maximum of concrete price per cubic yard.
- C. Concrete finished and found acceptable - 15% of concrete price per cubic yard.

PART 2 - PRODUCT

2.01 MATERIALS.

- A. Portland Cement. Standard brand of domestic Portland cement, ASTM C150, Type II, low alkali. Do not change brand of cement during progress of work without written approval of Engineer. For concrete exposed to sulfate-containing soils, solutions or other chemically aggressive solutions, use Type V Portland cement as specified.
- B. Normal Weight (Stone) Aggregates. Furnish natural aggregates from approved pits, free from opaline, chert, feldspar, mica (fools gold), siliceous magnesium limestone or other deleterious or reactive substances. Conform to ASTM C33 except as modified herein. Fine aggregates shall pass a #4 sieve. Do not use pozzolan or other additives to compensate for aggregate alkali reactivity.
 - 1. Coarse Aggregates. Clean, hard, fine-grained sound crushed rock or washed gravel which does not contain in excess of 5% in weight of flat, chip-like, thin, elongated, friable or laminated pieces, or more than 2% by weight of total amount of cherty material and soft particles, or more than 1% of chert as soft material as defined on Table 3 of ASTM C33. Consider any piece having a major dimension in excess of 5 times its average dimension to be flat or elongated.

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2. Maximum Sizes. As indicated on Drawings, except for concrete in water-bearing structures where coarse aggregate sizes per Table 2 of ASTM C33 shall be No. 467 (1½ inches), No. 57 (1 inch), or No. 67 (¾ inch) as otherwise required by design, specifications and ASTM C33, and except that coarse aggregate nominal maximum size shall not exceed one-fifth the narrowest dimension between sides of form, one-third the depth of slabs, or three-fourths of minimum clear spacing between reinforcing bars.
 3. Quality. All aggregates shall meet the test requirements of Article "Source Quality Control" hereinbefore.
 4. Abrasive Aggregate. "Alundum" by Norton Company, "Carborundum" by Union Carbide, or equal aluminum oxide, uniformly graded between No. 12 and No. 30 sieves, applied uniformly at minimum rate of 1/4 lb. per sq. ft. and locked into cement matrix with the final troweling.
- C. Admixtures. Use one manufacturer's products throughout. Upon Engineer's approval of use and of a particular brand or type, assure that use is reflected in mix designs. Approved manufactures are W.R. Grace and Master Builder Products.
1. General. Use no admixture containing chlorides or triethanolamine. Admixtures used in combination shall be physically and chemically compatible and shall be so certified by each admix manufacturer and by Testing Laboratory that prepared respective mix designs.
 2. Retarding-Densifier Admixture. In all Class "AA", Class "A", and Class "B" Concrete use a hydroxylated carboxylic acid type admixture in the amounts recommended by the manufacturer. The admixture shall provide the following, and Contractor shall provide proof thereof at time of request for approval:
 - a) Decrease drying shrinkage.
 - b) Increase compressive strength at all ages up to and including five (5) years.
 - c) Increase flexural strength, modulus of elasticity, and abrasive resistance.
 - d) The water/cement ratio and required strengths shall be maintained as scheduled (cement factor for a cubic yard of concrete, reduced proportionately).
 - e) There shall be no loss of workability resulting from reduction in slump. If the admixture is of liquid type, it must be considered in proportioning water.

3. Air Entrainment. Use air entrainment additive conforming to ASTM C260 as approved by the District.
- a) For normal weight aggregate concrete subject, after curing, to freezing temperature while wet shall contain air entrainment within limits of Table 4.2.1 of ACI 318, latest edition and Table 4.2.2.4 of ACI 301, latest edition.
 - b) Air Entrainment in Water-bearing Concrete Structures, as determined in accordance with ASTM C231 or C173, shall provide air contents as follows for mixes with the following coarse aggregate sizes:
 - (i) 5% \pm 1% for Size 467 (1½ inch nominal size)
 - (ii) 6% \pm 1% for Sizes 57 or 67 (1 inch or ¾ inch nominal sizes)
- D. Water. From a domestic potable source.
- E. Expansion Joint Material. Type I, preformed sponge neoprene expansion joint filler conforming to AASHTO Designation M-153.
- F. Bituminous Mastic. For fills at specific designated locations (such as fills at precast panel lift-eyes and dowel hole fills in precast concrete panels) use either Hot-Applied Type Joint Sealer, ASTM D1190 or Cold-Applied Type Joint Sealant, ASTM D1850. Material shall bond to concrete, prevent moisture infiltration and when set, shall be non-tracking at summer temperatures.
- G. Waterstops. Waterstops shall be produced by an extrusion process in such a manner that any cross section shall be dense, homogeneous and free from porosity and other imperfections. They shall be symmetrical in cross-sectional shape and uniform along their length.

The manufacturer must certify in writing that all waterstops are extruded from elastomeric polyvinyl chloride compound and that this compound shall be virgin PVC compound and not contain any scrap or reprocessed materials whatsoever.

The manufacturer must also certify in writing that all waterstops meet or exceed the physical properties requirements set forth in the U.S. Corps of Engineers' CRD-C572-74 specification and furnish a copy of certified independent laboratory test data showing compliance.

All waterstop intersections (ells, tees, crosses, etc.) shall be fabricated by the manufacturer and these shall have 2 ft. long legs to facilitate field butt splicing. Where field dimensions are encountered which will not accommodate the specified waterstop, waterstop of reduced dimension may be approved by the Engineer for a specific application.

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- H. Concrete Joint Sealants. For sealing joints in nonwater-bearing concrete surfaces, use materials conforming with requirements specified in Section 07920, "Sealants and Caulking". For sealing concrete joints which will be immersed or intermittently immersed in water or sewage-bearing surfaces, use: Karlee Company's "Lastex M" 100 percent solids polyurethane sealant; Mameco International's Vulkem 227, Vulkem 45, or Vulkem 245 contingent upon need for self-leveling, non-sag and atmospheric humidity at time of usage; Hunt's Seal Flex 227-U Special Reservoir Grade polyurethane sealant; or equal.
1. Primer. Use primer produced and/or recommended by sealant manufacturer.
 2. Back-up Preformed Joint Filler. Use closed-cell polyethylene foam or equal impervious, compatible, compressible foam material recommended for retaining sealant depth in expansion joints while curing. Use no bitumen or oil saturated material.
 3. Bond Breakers. Bond breakers, where required, shall be polyethylene tape or equal as recommended by sealant manufacturer to prevent adherence of sealant to back-up material.
- I. Dry Pack Mortar. Dry pack mortar shall consist of by volume one part special cement, three parts sand and water. The special cement and sand shall be combined in the proper proportions and then thoroughly mixed with the required amount of water. The dry pack mortar shall contain only enough water to permit placing and packing and shall be mixed for the time limit as indicated by the manufacturer in advance of use. The dry pack mortar shall be placed against thoroughly wet concrete and shall be cured by water, fog spray, spray-on membranes, sisal kraft paper, or other curing method acceptable to the District.
- J. Grout. Grout to be applied to the concrete surface shall consist of one part Portland Cement to three parts dry, washed sand to sufficient water to allow placement, screening, and finishing.
- K. Rich Grout. Rich grout shall consist of by volume one part Portland Cement, two parts sand and water. The rich grout shall be mixed and cured in the same manner as required for dry pack mortar.
- L. Neat Grout. Neat grout shall consist of Portland Cement, flyash, water and optional admixtures. Neat grout is intended to be injected under low pressure to backfill the annular space between steel casing pipes and carrier pipes.

M. Nonshrink Grout. Nonshrink grout shall be made with the following proportions:

One part Type II Portland Cement (one sack);
One part Nonshrink Aggregate (100 lbs.);
One part clean, well graded concrete sand (100 lbs.);
Approximately 5.5 gallons of water per sack of cement

1. In all locations where the surface of the grout will be exposed to view, the nonshrink grout shall be recessed approximately one-half inch back of the exposed surface and the recessed area filled with cement mortar grout.

N. Nonshrink Concrete. All nonshrink concrete shall contain one pound of nonshrink aggregate per pound of water that is in excess of two gallons per sack of cement. Recess surface exposed to field as specified for nonshrink grout above.

O. Nonshrink Aggregate. Nonshrink aggregate shall be non-metallic as produced by Master Builders, an equivalent product of Sonneborn, or a product by any other manufacturer that will meet the same ASTM requirements and equal performance.

P. Epoxy. Epoxies for grouting, crack repair, patching, bonding or other uses shall be as follows as manufactured by Adhesive Engineering Company, Sika Chemical Company, or equal by other manufacturer. Throughout, use products of single manufacturer.

1. All epoxy mixing, surface preparation and application shall be made in conformance with manufacturer's printed specifications, as approved by the Engineer.
2. For bonding new concrete to old concrete and for grouting metal anchors, use Sika's "Sikadur Hi-Mod", Adhesive Engineering Company's Concessive 1001-LPL, except Concessive 1170 or 1422 shall be used as recommended by manufacturer to satisfy entailed project temperature and surface moisture variations at time of application; or equal.
3. For patching concrete surfaces, making high strength epoxy concrete or grout, and grouting metal anchors, use Sika's "Sikadur Hi-Mod LV"; Adhesive Engineering Company's "Concessive 1180"; or equal.
4. For pressure injection or gravity-feed grouting, use Sika's "Hi-Mod LV"; Adhesive Engineering Company's "Concessive Structural Concrete Bonding Process System" as recommended by manufacturer and approved by Engineer; or equal.

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- Q. Liquid Curing Compound. Use "TLF" or "Clear 225 TU" by Hunt Process Company, Burke "Rez-X", or equal conforming to ASTM C309 and providing no detrimental affects with deferred finishes. On surfaces within reservoirs or other concrete structures containing potable water, use nontoxic materials which are free of odor and taste. Provide supporting technical data. Floor hardener treated floors shall use materials only as recommended in writing by hardener manufacturer.
- R. Sheet Curing Materials. ASTM C171, waterproof paper, polyethylene film or white burlap-polyethylene sheet, non-staining.
- S. Vapor Barrier Membrane. Under interior on-grade slabs of occupied areas provide lapped and sealed vapor barrier membrane using Fortiber "Moistop", "Damproof XX" by Nicolet of California, Incorporated, or equal with manufacturer's recommended polyethylene pressure sensitive tape sealant used continuously at lapped joints, penetrations and at perimeter walls or footing surfaces. Throughout, use products and system of single manufacturer.
- T. Gasket Seal for Manhole and Wet Well Precast Concrete Members. Provide gasket seals at mating joint of precast concrete sections. Size gaskets to suit joint dimensions, surface conditions and to assure watertight completed installation. Seal shall consist of either compressible closed-cell neoprene rods with compatible bonding agent recommended by material manufacturer; of No. 95 extruded butyl rod and No. 2 Primer each produced by General Sealants, Incorporated, City of Industry, California; or equal non-bituminous joint sealing compressible gaskets.
- U. Synthetic Sponge Rubber Filler. Synthetic rubber filler shall be an expanded closed-cell sponge rubber, manufactured from a synthetic polymer neoprene base. The material shall be No. 750.3 Ropax Road Stock as manufactured by the Presstite Division of Interchemical Corporation; Bondtex as manufactured by Rubatex Corporation; or approved equal. The size of the material shall be 25% greater in diameter than the nominal joint width. The manufacturer's instructions for surface preparation and application shall be used as a guide for installation, except that the material shall not be installed by stretching beyond its normal length.
- V. Expansion Joint Filler. Bituminous fiber expansion joint filler shall be in accordance with ASTM D1751. Bituminous expansion joint material shall not be used in joints to be sealed with synthetic rubber sealing compound.

- W. Concrete Expansion Bolts/Deferred Bolting Device (D.B.D.). Except as otherwise specified, where expansion bolts are called for on the Drawings, Parabolt Concrete Anchors as manufactured by the Molly Company, Kwik-Bolts as manufactured by McCulloch Industries, Incorporated, or a concrete anchor by any other manufacturer that shall meet the same Federal Specification requirements and shall equal the performance, shall be used. All bolts thus furnished and used on this project shall be manufactured of stainless steel.

2.02 CONCRETE MIXES

- A. 28-Day Compressive Strength. It shall be the sole responsibility of the Contractor to mix, place, and cure concrete which shall be of 150 lb./cu.ft. nominal density and which shall attain the compressive strengths at 28 days as designated on Structural Drawings or in these specifications for use in various locations.
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- B. Maximum Aggregate Size. Conform to Article 2.01 B.2. For Class "AA" concrete use 1½ inch maximum size aggregate unless otherwise designated; for Class "A" and Class "B" use 1 inch maximum size aggregate; for Class "C" and Class "D" use ¾ inch maximum size aggregate. In no case shall the size of the coarse aggregate exceed 75% of the horizontal space between reinforcing bars or between reinforcing bars and forms.
- C. Mix Designs. Conform with requirements of Article 1.04 "Concrete Mix Designs and Preliminary Tests". At least 60 days before any Class concrete is to be placed, the Contractor shall submit for approval for each proposed mix a mix design made by a Civil Engineer registered in California or a Testing Laboratory approved by the District.
1. In lieu of a submittal from the Contractor for a required mix design, upon approval of the Engineer the following mixes may be used with a slump of 4 to 5 inches:

EMWD Mix #9 (Class "A" structural concrete)

Cement: 5.5 sacks/c.y., 517 lbs./c.y.
Water: 32-34 gal./c.y.
Aggregate: 1985 lbs./c.y. - #3 (¾ inch to 1 inch max.)
Sand: 1359 lbs./c.y.
Admixture: **Master Builders:** 4 1 fl. ozs./100 lbs. of cement, Pozzolith Type 300-N
W.R. Grace: 5 oz/100 lbs. cement WRDA-79, or 3 oz/100 lb. cement WRDA-64 or other water-reducing admixture meeting ASTM C-494 Type A (21 fl. oz/c.y.).

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Standard Specifications for Public Work Construction Class 560-C-3250
(Optional mix for Class "A" structural concrete)

Cement: 5.96 sacks/c.y., 560 lbs./c.y.
Water: 38 gal./c.y.
Aggregate: 1478 lbs./c.y. - # 3 (3/4 inch to 1 inch max)
246 lbs./c.y. - # 4 (3/8 inch max)
Sand: 1355 lbs./c.y.
Admixture: **Master Builders:** 4 + 1 fl. ozs./100 lbs. of cement, Pozzoloth
Type 300-N
W.R. Grace: 5 oz/100 lbs. cement WRDA-79, or 3 oz/100 lb.
cement WRDA-64 or other water-reducing admixture
meeting ASTM C-494 Type A (21 fl. oz/c.y.).

The combined aggregate grading shall be per Standard Specifications
for Public Work Construction Section 201- 1.3.2 as shown below:

<u>Sieve size</u>	<u>Percent Passing</u>
1½"	100
1"	95-100
¾"	77-93
⅜"	50-70
No. 4	39-51
No. 8	31-41
No. 16	22-32
No. 30	12-22
No. 50	3-9
No. 100	0-3
No. 200	0-2

EMWD Mix #6 (Class "B" concrete)

Cement: 4.7 sacks/c.y., 441.8 lbs./c.y.
Water: 30-32 gal./c.y.
Aggregate: 415 lbs./c.y. - #4 (3/8 inch max.)
795 lbs./c.y. - #3 (3/4 inch to 1 inch max.)
1006 lbs./c.y. - #2 (1½ inch max.)
Sand: 1230 lbs./c.y.
Admixture: **Master Builders:** 4 1 fl. ozs./100 lbs. of cement, Pozzoloth
Type 300-N
W.R. Grace: 5 oz/100 lb. cement WRDA-79, or 3 oz/100 lb.
cement WRDA-64 or other water-reducing admixture
meeting ASTM C-494 Type A (18 fl. oz/c.y.).

Riverside County Class "B" Concrete

Cement:	5.5 sacks/c.y., 517 lbs./c.y.
Water:	36.5 Gal./c.y.
Course Agg. 1" x #4:	1559 lbs./c.y.
Course Agg. 3/8" x #8:	226 lbs./c.y.
Sand:	1434 lbs./c.y.
Water Cement Ratio:	0.59 max.
Slump:	4" max.

Course aggregate shall meet the grading requirements of ASTM C33.

The combined aggregate grading shall be per Caltrans Standard Specification 90-3.04(1"max), as shown below:

<u>Sieve size</u>	<u>Percent Passing</u>
1½"	100
1"	95-100
¾"	55-100
⅜"	45-75
No. 4	35-60
No. 8	27-45
No. 16	20-35
No. 30	12-25
No. 50	5-15
No. 100	1-8
No. 200	0-4

Riverside County Class "B" Machine Laid Concrete

Cement:	5.5 sacks/c.y., 517 lbs./c.y.
Water:	34.0 Gal./c.y.
Course Agg. 1" x #4:	1388 lbs./c.y.
Course Agg. 3/8" x #8:	295 lbs./c.y.
Sand:	1589 lbs./c.y.
Water Cement Ratio:	0.55 max.
Slump:	2" max

Course aggregate shall meet the grading requirements of ASTM C33.

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The combined aggregate grading shall be per Caltrans Standard Specification 90-3.04(1"max), as shown below:

<u>Sieve size</u>	<u>Percent Passing</u>
1½"	100
1"	95-100
¾"	55-100
⅜"	45-75
No. 4	35-60
No. 8	27-45
No. 16	20-35
No. 30	12-25
No. 50	5-15
No. 100	1-8
No. 200	0-4

EMWD Mix #10 (Class "C" concrete)

Cement:	4.5 sacks/c.y., 423 lb./c.y.
Water:	32-34 gal./c.y.
Aggregate:	1903 lb./c.y.
Sand:	1480 lb./c.y.
Admixture:	None

2.03 CONCRETE MIXING

Concrete shall be ready-mixed, supplied from an off-site commercial ready-mix plant approved by District, each load accompanied by a bonded weighmaster's certificate listing the quantity of each concrete ingredient, admixture quantity, water content and slump, and time of loading and departure from ready-mix plant. Also include notations to indicate equipment was checked and found to be free of contaminants prior to batching.

- A. Ready-Mixed Concrete. Unless approved otherwise in advance of batching, all concrete of a single design mix for any one day's pour shall be from a single batch plant of a single supplier. Conform to ASTM C94, except materials, testing and mix design shall be as specified herein. Use transit mixers equipped with automatic devices for recording number of revolutions of drum.

All applicable mixing requirements specified herein for concrete mixed at the site shall govern transit-mixed concrete and the District shall have free access to the batching plant at all times.

For concrete mixed in top-loading truck mixers, each batch shall be turned not less than 40 and not more than 300 revolutions of the mixer drum at mixing speed when the fine and coarse aggregate are charged into the mixer simultaneously (cement and water may be charged separately). When the fine and coarse aggregate are charged into the mixer separately, each batch shall be turned not less than 60 and not more than 300 revolutions of the drum at mixing speeds.

For concrete mixed in end-loading truck mixers, each batch shall be turned not less than 60 and not more than 300 revolutions of the mixer drum at mixing speed when the mixer is loaded in excess of 50 percent of the gross drum volume as provided hereinafter. When the mixer is loaded (not to exceed 50 percent of the gross drum volume) the provisions specified for top-loading truck mixers will apply.

Truck mixers shall be loaded in accordance with manufacturer's capacity ratings, but in no case shall the volume of mixed concrete exceed 50 percent of the gross volume of the drum for top-loading mixers and 58 percent of the gross volume of the drum for end-loading truck mixers.

Mixing speed shall be in accordance with manufacturer's recommendations, but in no case shall the speed be less than 4 revolutions per minute or greater than a speed resulting in a peripheral velocity of the drum of 225 feet per minute. The power unit shall be equipped with a governor to insure constant speed. Each truck mixer shall be equipped with a device for counting the number of revolutions of the drum, which device shall be interlocked so as to prevent the discharge of concrete from the drum before the required number of turns. After the drum is once started, it shall be revolved continuously until it has completely discharged its batch. Water shall not be admitted to the mix until the drum has started revolving. The right is reserved to increase the required minimum number of revolutions or to decrease the designated maximum number of revolutions allowed, if necessary, to obtain satisfactory mixing, and the Contractor will not be entitled to additional compensation because of such increase or decrease.

- B. Mixing Water Limitations. If water is added at the batching plant, ready-mixed concrete shall not be held in the mixer for more than one and one-half hours from the time the water is added. When temperature of concrete is 85°F or above, reduce holding time to 45 minutes. Do not deliver ready-mixed concrete to job with total specified amount of water incorporated therein. Without 2½ gallons of water per cubic yard, then incorporate in mix before concrete is discharged from mixer truck. If no water is added at the batching plant, measured quantities of water shall be added at the site and a minimum of fifteen minutes mixing given, or mixing to overcome segregation. Adding of water shall be under observation of Inspector. Each mixer truck shall arrive at the job site with its water container full. In event container is not full or concrete tests to a greater slump than specified, the load is subject to rejection.

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- C. Job Mixed Concrete. Contractor shall obtain the approval of the District for equipment and procedures proposed for job mixed concrete.
- D. Consistency and Slump. Adjust quantity of water so concrete does not exceed maximum slumps specified when placed or specified water/cement ratio; use minimum necessary for workability required by the part of the structure being cast. Measure consistency of concrete in accordance with ASTM C143. Concrete exceeding maximum slump will be rejected.

<u>Part of Structure</u>	<u>Maximum Slump</u>
Footings and mass concrete not reinforced	3 inches
Slabs, and floors and reinforced footings	2 to 3 inches
Columns, walls over 8 inches thick	3 to 4 inches
Walls up to 8 inches thick	3 ½ to 4 inches
Equipment bases	3 to 5 inches

PART 3 - EXECUTION

3.01 PREPARATION BEFORE PLACING

Remove excess water from forms before concrete is deposited. Divert any flow of water without washing over freshly deposited concrete. Remove hardened concrete, debris, and foreign materials from interior of forms and from inner surfaces of mixing and conveying equipment.

- A. Forms. Prior to placing concrete, forms shall meet the requirements of Section 03150, as approved by the Engineer. Concrete to be poured on earthwork such as slabs or stairs on grade shall meet the same requirements for approval prior to pouring as above specified for the approval of forms.
- B. Reinforcement. Reinforcement shall have been secured under work of Sections 03150 and 03200, and inspected and approved. Embedded metal shall be free of old mortar, oils, mill scale, and other encrustations or coatings that might reduce bond. Wheeled concrete-handling equipment shall not be wheeled over reinforcing nor shall runways be supported on reinforcing.

"Break-out" bars or dowels bent for forming, for subsequent straightening prior to adjacent pour, will be allowed with bars of #5 maximum size, only where specifically called out on the Drawings, and only where kinks or breaks are not likely as a result of straightening. This does not imply approval of cold joints where none designed, or any deviation from construction joint requirements elsewhere in these specifications.

- C. Wetting. Wet wood forms sufficiently to tighten up cracks. Wet other materials sufficiently to reduce suction and maintain concrete workability.
- D. Earth Subgrade. Lightly dampened 24 hours in advance of concrete placing, but not muddied. Reroll as necessary for smoothness, and remove all loose materials.
- E. Aggregate Fill Base. Prepare same as earth subgrade. Center 30-mil plastic sheeting or roofing cap sheet on base course under indicated waterstop joints to retain mix fines within mix and prevent their percolation into base course.

3.02 WATERSTOPS

Heat fuse joints and connections in strict compliance with manufacturer's instructions including heating tools and devices. Waterstops shall be continuous in joints, following offsets and angles in joints until spliced to waterstops at intersecting joints, completely sealing the structure. Waterstops shall be aligned and centered in joints. Secure flanges of waterstops to reinforcing bars with 18 gage wire ties spaced maximum 18 inch center. All waterstops, splices, joints, intersections, and welds shall be tested with an approved holiday spark tester before concrete is placed. The contract drawings do not indicate every location that is to have waterstop. Waterstop shall be located in all water bearing structure walls and slabs.

Waterstop shall be positioned correctly during installation and all splices in length or at intersections shall be performed by heat sealing and in accordance with manufacturer's recommendations.

Waterstop joints shall conform to Drawing requirements, if requirements are shown on the Drawings, and, whether or not requirements are shown on the Drawings, shall be properly heat-spliced at ends and crosses to preserve continuity. All splicing shall be done using mitered joints. Forms for construction joints shall be constructed in such manner as to prevent injury to waterstops. Waterstops shall be securely held in position in the construction joints by wire ties.

In narrow walls requiring both rebar and waterstop, the rebar shall be offset to one side and the keyway and/or waterstop shall be offset to the opposite side sufficiently to allow placement of both rebar and waterstop without contact. In order to accommodate such an offset, double curtain steel may be replaced by one properly designed larger bar upon approval by the Engineer.

All in-place waterstop installations including locations and joints shall be approved by District prior to placement of concrete.

3.03 JOINTS IN CONCRETE

Locate joints in concrete where indicated unless otherwise approved. Obtain approval of points of stoppage of any pour, prior to scheduling of pour.

- A. Construction Joints. Unless otherwise shown, all construction joints shall be provided with suitable keyways or other keying methods. Clean and roughen contact surfaces of construction joints by removing entire surface and exposing clean aggregate solidly embedded in mortar matrix. Use mechanical chipping, sandblasting, or application of surface mortar retarder followed by washing and scrubbing with stiff broom. Cover and protect waterstops and other inserts from damage. The hardened concrete shall be watered and kept wet for at least 24 hours before placing new concrete. Where construction joints are not indicated on the Drawings, provide slabs and walls with construction joints at intervals not greater than 30 feet.

Starter walls shall be used unless detailed otherwise. Where utilized, starter walls shall extend a minimum of 3½ inches.

Where "break-out" bars are required by the contract drawings for future structure extensions, except where other methods are specifically set forth on the contract drawings a required mortar-tight enclosure of the reinforcing dowels shall be provided by installing the break-out bars in capped PVC pipe embedded 1 inch minimum into the structural concrete.

- B. Expansion Joints. Provide where indicated, ½ inch width unless otherwise detailed. Except where synthetic rubber (sealant) sealed joints are shown or specified, provide expansion joint filler and joint sealer, filler head down ½ inch to ¾ inch and sealer finished flush with surface. At synthetic rubber sealed joints, hold filler down ½ inch unless otherwise shown, ready to receive sealant.
1. Location of joints in interior slabs on grade shall be as detailed on the Drawings. Sawed control joints shall be as approved by the Engineer
 2. Control joints in exterior slabs shall be located as indicated on the Drawings, or as follows if not noted:
 - a) Provide bond breaker with ½ inch expansion joint material at junction of walls, bases, columns, etc.
 - b) Provide ½ inch expansion joints at changes in direction of slabs, or abrupt changes in width and not greater than twenty (20) feet apart on slabs without control joints.
 - c) Control joints in exterior slabs shall be sealed with the specified sealer.

- C. Roof and Floor Slabs. Pour slabs in alternating checkerboard fashion between indicated construction joints, as approved. Slabs in place shall be cured as required elsewhere in these specifications a minimum of seven (7) days before adjoining slabs are cast.
- D. Intermediate Screed Strips. Intermediate screed strips shall be required for all slab pours unless otherwise approved. Such approval for the omission of intermediate screeds shall be for each individual pour and no blanket approval shall be given.
- E. Gasket Seals. At joints between precast concrete manhole and/or wet well units, clean mating surfaces of both members. Then within groove, place and lay continuous rod of specified compressible gasket to provide watertight installation after placement of matching tongued concrete member and compression of the gasket.
- F. Joining Existing Structures. Where a construction joint to an existing structure requires a waterstop and none is found in the existing structure, Contractor shall join the old structure by chamfering the new concrete at the joint and filling the chamfer with specified epoxy sealant.

Where required reinforcing is not found protruding from the existing structure, required reinforcing shall be placed by drilling and placing dowels of the proper size and spacing.

Where required waterstop and reinforcing is found in the existing structure, joints shall be treated as other construction joints under Articles 3.01 and 3.02.

- G. Concrete for Buried Electrical. Buried electrical ducts, conduits & similar type items are to be encased in Class C red colored concrete as designated below.

Aggregate for Class C Concrete for Encasement of Electrical Conduits:

1. Graded as specified in ASTM C 33, Size Number 8.
2. Provide concrete utilizing this aggregate equal to Class C concrete in all other respects.
3. Manufacturers: Frank D. Davis Company, Red Oxide Number 1117 or equal.

3.04 CONVEYING AND PLACING CONCRETE

- A. Do not pour concrete until reinforcing steel and forms have been inspected and approved. Notify District not less than one full working day in advance of readiness for inspection of forms and reinforcing. Specific approval of individual forms by the Engineer shall be obtained before ordering of concrete. The Contractor shall give the Engineer a minimum of 24 hours notice of a scheduled concrete pour following the completion of forming. Upon inspection of the forms, reinforcing, waterstop placement, etc., the Engineer will immediately issue a written approval to pour concrete showing approval of the scheduled pour or disapproval. In the event of disapproval, the Engineer will show the Contractor the specific deficiencies, for correction within the 24 hour period prior to the scheduled pour. Upon notification by the Contractor of correction of deficiencies and reinspection and approval by the Engineer, the pour may proceed as scheduled. In the event required corrections are not made, or are not approved, the disapproval of the pour shall stand and the pour shall not proceed as scheduled, but shall be rescheduled.

Any concrete not in accordance with these specifications, out of line, level, or plumb; or showing cracks, rock pockets, voids, stalls, honeycombing, exposure of reinforcing, or any other damage which will be detrimental to the work will be considered defective and must be corrected and replaced as directed by the Engineer at no additional cost to the District. Any concrete work that is not formed as indicated; is not true within 1/250th of the span; is not true to intended alignment; is not plumb or level where so intended; is not true to intended grades and levels; has voids or honeycombs that have been cut, resurfaced or filled, unless under the direction of the Engineer; has any sawdust, shavings, wood or embedded debris; or does not fully conform to the contract provisions, shall be deemed to be defective and shall be removed from the site.

1. Handle or pump no concrete utilizing aluminum equipment.
2. Delivery tickets shall show the following:
 - a) Batch number.
 - b) Mix by compressive strength with maximum aggregate size.
 - c) Types and amount of admixtures included.
 - d) Air content.
 - e) Slump.
 - f) Time of loading and discharge.
 - g) Amount of water put in at batch plant.

- h) Location in the work.
 - i) Specification class of concrete.
 - j) Date of delivery.
3. If any water is added at the job site, it shall be approved by the Engineer and the delivery ticket noted as to the amount of water added. One copy of each delivery ticket shall be submitted daily to the Engineer.
- B. Weather. Do not place concrete during rain or freezing weather unless approved measures are taken to prevent damage to concrete. Concrete placed during periods of dry winds, low humidity, high temperatures, and other conditions causing rapid drying shall be initially cured with a fine fog spray of water applied immediately after finishing and maintained until final curing operations are started. Also under hot weather conditions, steps shall be taken to reduce concrete temperatures and water evaporation by proper attention to ingredients, production methods, handling, placing, protection, and curing.
- 1. Preventative measures taken for concrete placement during hot or cold weather shall be approved by the Engineer. There shall be no placing of concrete when ambient temperatures are below 35°F or above 100°F, or when such will be the case within 24 hours of the pour. Any concrete previously placed shall be protected from freezing.
- C. Conveying. Do not drop concrete from its point of release at mixer, hopper, tremies, or conveyances more than 6 feet, nor through reinforcing bars in a manner that causes segregation. Provide form windows, tremies, elephant trunks, and equivalent devices as required. The use of chutes for conveying or depositing concrete is not allowed except for small isolated portions of the work and only with prior approval. Deposit concrete directly into conveyances and from conveyances to final points of repose. Deposit concrete so that the surface is kept level throughout, a minimum being permitted to flow from one portion to another.
- D. Placing Concrete. Concrete shall be placed and compacted within 90 minutes after water is first added to the mix, and no concrete shall be placed after there is evidence of initial set. This placing time shall be reduced to 45 minutes when the temperature of the concrete is 85°F or above. Retempering of concrete is not allowed.
- 1. Horizontal Construction Joints. Horizontal surfaces of previously placed and hardened concrete shall be wet and covered with a 6 inch thick layer of concrete of the design mix with 50% of coarse aggregate omitted just before balance of concrete is placed.

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2. Lifts. Pour concrete into forms immediately after mixing in a manner that will prevent separation of ingredients. Except as interrupted by joints, all formed concrete shall be placed in continuous, approximately horizontal layers, the depths of which generally shall not exceed 18 inches.
 - a) Walls and Slabs. In order to minimize the effects of shrinkage, concrete shall be placed in units bounded by construction joints. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured at least 7 days for hydraulic structures and 3 days for all other structures before the contiguous unit or units are placed. The exception is corner sections of vertical walls, which shall not be placed until the adjacent wall panels have cured at least 14 days for hydraulic structures and 4 days for all other structures.
 - b) Beams and Slabs. Pouring of all beams and slabs must be continuous and monolithic with the floor system where so shown on the Drawings. At least two (2) hours must elapse after depositing concrete in walls or columns before pouring beams, etc. supported thereon.
3. Pumping Concrete. No increase in the specified slumps will be allowed and required water/cement ratios shall be maintained for concrete pumping. Aluminum tubes are not acceptable for conveying concrete. Equipment shall be capable of maintaining the specified pour rates. Conform with requirements of ACI 304.2R-96, except as more stringent requirements are specified herein. Minimum conduit (tube) diameter shall be 4 inches.
4. Pour Rates.
 - a) Vertical Elements. Place concrete in lifts as specified at a rate that does not overstress forms nor allows the top of a lift to begin to harden before the next lift is placed. Cold joints are not acceptable.
 - b) Slabs. Place concrete at a rate that ensures all deposits are joined to concrete that is still plastic and within 10 minutes of the previous pour. Concrete adjoining alternate slabs shall not be placed until the adjoining concrete has cured as required elsewhere in this specification for at least seven days unless otherwise approved by the Engineer.
5. Field Tests. During the progress of construction, the District will have tests made to determine whether the concrete, as being produced, complies with the standards of quality specified herein. These tests will be made in accordance with ASTM C31 and ASTM C39.

Each test will consist of a minimum of four cylinders, and the District, at his discretion, may take such tests as frequently as necessary to prove the quality of the concrete. In no case shall less than one test be made of each day's pour or of each 50 yards of concrete. The Contractor shall furnish the concrete for such tests but the remaining testing expense will be borne by the District. Specimens will be cured under job conditions.

For all concrete, the standard age of test will be 28 days, but the 7-day test may be used provided that the relation between the 7 and 28 strengths of the concrete is established by tests for the materials and proportions used.

Slump tests will be in accordance with ASTM C143.

Enforcement of Strength Requirement. Concrete is expected to reach a higher compressive strength than that indicated as minimum compressive strength. At least the specified minimum cement shall be used, and more cement shall be used, if necessary, to meet all minimum and maximum requirements shown in the table. Failure to meet these conditions shall be considered failure of the concrete.

One test shall consist of the results of testing three (3) standard specimens in accordance with ASTM C31 and C39, except that if one specimen in a test shows manifest evidence of improper sampling, molding, or testing, it shall be discarded and the remaining two strengths averaged. Should more than one specimen presenting a given test show defects due to improper sampling, molding, or testing, the entire test shall be discarded.

If the concrete fails to meet the specifications in the preceding paragraph, the District shall have the right to ask for additional curing of the affected portion followed by cores taken in accordance with ASTM C42 all at the Contractor's expense. If the additional curing does not bring the average of three cores taken in the affected area to at least the strength specified, the District may require strengthening of the affected portions of the structures by means of additional concrete or steel, or he may require replacement of these affected portions, all at the Contractor's expense. Core tests for below-strength concrete shall be paid for by the Contractor even though such core tests indicate the concrete has obtained the required minimum compressive strength.

- E. Compaction. Effective compaction shall be obtained by vibration, agitation, spading, and rodding until the concrete is free from voids, air bubbles, or rock pockets. Vibrators shall not be used to transport concrete within the forms. No less than one spare vibrator for each two vibrators in use on a pour, each in good working condition shall be kept on the job during pours. One experienced workman shall be assigned to the operation of each vibrator as his only duty. Operations not deemed to be satisfactory by the District shall be immediately corrected.

Cast-In-Place Concrete
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1. Vibration. All concrete, with the exception of concrete slabs 4 inches or less in depth, shall be compacted with high frequency, internal mechanical vibrating equipment supplemented by hand spading and tamping. Concrete slabs 4 inches or less in depth shall be consolidated by wood or metal grid tampers, spading and settling with a heavy leveling straight edge. Carefully vibrate concrete around waterstops and ensure the waterstops are not bent or damaged.
 - a) Vibrators. Vibrators shall be designed to operate with vibratory element submerged in the concrete, and shall have a frequency of not less than 7,000 impulses per minute when submerged. The vibrating equipment shall be adequate at all times in number of units and power of each unit to consolidate the concrete to the maximum practicable density so that it is free from air pockets, honeycomb, entrapped air and so it closes snugly against all surfaces of forms and embedded items.
 - b) Operation of Vibrators. Do not allow vibrators to contact forms or reinforcing. In vibrating a freshly placed layer of concrete, the vibrator shall be inserted vertically through the preceding layers that are still completely plastic and slowly withdrawn, producing the maximum obtainable density in the concrete without creating voids. Under no circumstances shall the vibrator enter or disturb concrete that has stiffened or partially set. The interval of vibrator placing shall not exceed two-thirds the effective visible vibration diameter of the submerged vibrator. Avoid excessive vibration that causes concrete segregation or causes an inordinant amount of entrained air to move to the face of the forms, which shall be causes for rejection of the concrete pour.
 - c) Re-Vibration of Retarded Concrete. Concrete containing retarding admixture for structural walls and columns shall be placed by a schedule that allows each layer of concrete to be in place and compacted for at least 30 minutes before the next layer of concrete is placed. Bleed water on the surface of the concrete shall be removed before additional concrete is placed and the concrete in place re-vibrated before the next lift is placed. At tops of walls and columns concrete containing excess water or fine aggregate caused by vibration shall be removed while plastic, and the space filled with compacted concrete of the correct proportions, vibrated in place.

F. Slabs. Set screeds at maximum 8 foot centers, as approved, and verify correct elevations with instrument level, and consideration for any camber in the form. Compact and tamp concrete to bring 3/8 inch mortar to surface, and wood float to straightedges and screeds. Make finished surfaces level or sloped as detailed, with maximum deviation of 1/4 inch from 10 feet straightedge for exposed finishes, and there shall be no low spots to impound water. Do not use steel or plastic floats of any kind of initial floating operations. Unless otherwise specified, do not apply hereinafter specified finishes until surface water disappears and surface is sufficiently hardened. Remove all bleed water and laitance as it appears.

G. Tolerances

1. Forms, sleeves, and inserts shall be set, and concrete shall be cast, to the lines and grades indicated on the plans and as detailed in these specifications. The maximum deviation from true line and grade shall not exceed the tolerances listed in the following table.

Item	Maximum	Tolerance
Sleeves and inserts	+1/8 inch	-1/8 inch
Projected ends of anchor bolts	+1/4 inch	-0.0 inch
Anchor bolt setting	+1/16 inch	-1/16 inch

2. Formed surface tolerances for concrete shall meet requirements for ACI surface classes as follows, unless otherwise specified herein or in the Special Provisions.

Class "A". Exposed interior and exterior concrete to be coated or painted. Abrupt irregularities must meet a modified requirement of 1/16 inch maximum.*

Class "B". Coarse textured concrete intended to receive plaster, stucco or wainscoting.

Class "C". Exposed interior and exterior concrete not requiring coating or painting.

Class "D". Permanently concealed surfaces below permanent ground level or operating water surface.

Permitted Irregularities in Formed Surfaces
Checked with a 5-foot Template

Type of Irregularity	ACI Surface Tolerance Class of Surface			
	A	B	C	D
Gradual	1/8 inch	1/4 inch	1/2 inch	1 inch
Abrupt	*1/16 inch	1/4 inch	1/4 inch	1 inch

3. Deviation in alignment of slabs or walls shall not exceed a rate of 1/8 inch in 10 feet within the tolerances specified.
4. Slabs shall be uniformly sloped to drain.
5. Regardless of the tolerances listed herein, it shall be the responsibility of the Contractor to limit deviations in line and grade to tolerances which will permit proper installation and operation of mechanical equipment and piping.

3.05 CURING FORMED CONCRETE

Maintain forms containing concrete in a thoroughly wet condition until forms are removed. Maintain all concrete in a continuously moist condition for not less than 7 consecutive days after pouring (14 days on projects subject to Federal Wage Determination). Keep concrete moist with fine fog spray until protected by curing materials. Use water curing method, specified liquid membrane-forming compound, or concrete curing paper or mats, all subject to approval for each specific use. Vertical surfaces shall not be cured by sprinkling method unless specifically approved by the Engineer.

3.06 PLACING GROUT

- A. Grout all steel bearing plates, columns, and other structural parts set to hardened concrete using nonshrink grout. Use an approved premixed grout, adding only water in the amount recommended by the manufacturer.
- B. Generally, use driest practicable mix and pack into place so no voids remain between steel and the supporting concrete.
- C. When necessary, use sufficient water to produce a flowable mixture, and pour, first forming sand dams to retain the grout until partially set. When sufficient set is attained, remove dams and pack grout to refusal on all four sides, to eliminate voids; fill any resulting edge voids with drier mix.

- D. In all locations where the surface of the grout will be exposed to view or in an area of high humidity, nonshrink grout shall be recessed to approximately one-half inch back of the exposed surface and the recessed area filled with cement mortar grout.

3.07 ANCHORS, SLEEVES, STAIR NOSINGS, ETC

- A. Install in forms, in accordance with layout information provided by their suppliers, all necessary anchors, anchorage inserts, sleeves, slots, etc., required for fastening or passing the work of other Sections; also all such surface items as edge angles, manhole frames and other castings, trench cover frames or gratings, access panels, expansion joint covers, stair nosings, etc., having anchorage features requiring that they be installed before concrete is placed.
- B. All such items shall be accurately located, carefully plumbed and leveled, securely fastened in place so that alignment and level will not be disturbed during concreting, and protected from damage until concreting is completed.
- C. Provide all openings and chases in concrete, shown on the Drawings or as otherwise required.

3.08 EQUIPMENT BASES

Provide all concrete bases or foundations shown for equipment or fixtures included in other Sections of the work unless the Drawings or Specifications indicate that bases are to be furnished as part of the equipment.

- A. Material. In general, use Class "A" or Class "B" concrete as required by Article 1.04, unless otherwise specified on the Drawing.
- B. Installation of Nuts and Bolts. Work from approved setting Drawings. Use steel or plywood templates and apply nuts above and below, to hold bolts in vertical position. During the course of the placement of any concrete, the Contractor shall have sufficient personnel, of whatever skill or trade required, available to check the location of all embedded anchor bolts, edge angles for grating, or any other item which may be deemed appropriate by the Engineer. This check shall be made immediately after the work has progressed to a point such that the item shall not be subject to disturbance and prior to the concrete having obtained sufficient set such that adjustment of the items, if necessary, cannot be made with unacceptable damage to the concrete. If the operation is such that repeated checks are required, they shall be made.
- C. Size. Generally, the size indications and dimensions of bases shown on Drawings are approximate. The actual size, in all cases, shall be determined from the equipment furnished. Work from approved equipment supplier's drawings.

3.09 FINISHING FORMED CONCRETE

- A. Within 5 days following the removal of forms, the following finishing operations shall be performed. No other finishing operations are required for permanently concealed concrete (i.e., concrete below permanent ground surface or operating water level). When specifically approved by the Engineer, finishing of concrete may be performed by units, (i.e. a complete wall, a complete structure, etc.), in which case 10% minimum concrete payment shall be retained for the finishing operation.

Finishing operations to be performed:

1. Remove projections and offsets.
2. Saturate form tie holes with water and fill voids with mortar of same mix as concrete (less coarse aggregate), cure and dry; white bonding glue manufactured for this purpose may be added to the mix in accordance with the manufacturer's instructions.
3. Patch all damaged areas due to spalling, voids, rock pockets and bleeding of cement (generally caused by form leaks) with mortar over a concrete adhesive bonding agent manufactured for this purpose and applied in accordance with the manufacturer's instructions. Cut out all rock pockets to sound concrete, edges square to the surface and back beveled, and patch with tempered mortar applied over an approved epoxy concrete adhesive. Large areas (as determined by the Engineer), and all other damaged areas over ½ inch in depth shall be repaired similarly. Other damaged areas less than ½ inch in depth shall be similarly repaired, but an approved white concrete bonding agent may be used in place of epoxy concrete adhesive.
4. Finish patches flush with adjoining surfaces and cure the same as the original concrete.

Attention is directed to the need for properly curing the repair patches, and for utilizing the proper bonding agent for a given situation (i.e., below operating water level). Information regarding the manufacturer's recommended use shall be furnished to the Engineer for his evaluation.

Pursuant to the specifications, all concrete must be cured for seven (7) days after pouring or patching, including sacked concrete, except concrete sacked after 7 days following pouring or patching needs no further curing.

5. Small air holes may be considered those which would be covered over by sacking, and need not be repaired on external walls being waterproofed or other areas not required to be sacked under the specifications. Air holes larger than this shall be considered voids.

Minor cement paste leaks are those not exposing aggregate and which can be covered over by sacking, and should be treated similarly to small air holes. Anything larger shall be considered a rock pocket or a bleed hole, depending upon the condition. Some small bleed holes may, at the discretion of the Engineer, not need to be chipped out, but may be merely sandblasted to sound concrete prior to patching.

- B. All exposed interior and exterior formed concrete (i.e., concrete not permanently concealed from direct visible exposure under facility operating conditions, including gallery and equipment room walls and ceilings), and all concrete to be coated in the finished structure shall, in addition to the foregoing, be Brush-Off Blast Cleaned (SSPC-SP7-63) to open all paste and air holes and to remove curing compound and dust. It shall then be rubbed with cement of consistent color and burlap and/or with brick and water to eliminate pockets and produce reasonable smooth surfaces suitable for painting. A reasonable smooth surface shall be defined as a surface with no projections or form marks greater than 1/16 of an inch and no indentations after finishing. Chamfers and fillets shall be made straight and true, and uniform.

Concrete to be temporarily concealed until facility is expanded shall be considered exposed concrete.

- C. All formed concrete within water bearing structures and not subject to Item 3.09.B shall be brush-off cleaned (SSPC-SP7) to open all paste and air holes and to remove curing compound and dust. Alternatively, a high-pressure water spray may be used if the method is demonstrated by the Contractor to be effective in removing the curing compound and opens all defects. The high-pressure water spray alternative must be approved by the Inspector.

All defects greater than ¼ inch in depth are to be filled. Prep defects by applying by brush, a neat cement/water/latex bonding agent paste. Defects shall then be filled by immediately applying and scrubbing in a thick 60-grit sand/cement mortar paste with a sponge rubber float. The mortar is to fill defects only and all excess material shall be cut from the surface with the edge of a steel trowel. Apply curing compound to all repairs.

3.10 FINISHING SLABS AND FLATWORK

As specified above, initially compact, bring 3/8 inch mortar to surface and float surfaces. Finished surfaces shall be "puddle-free" and level or sloped as indicated to above specified maximum deviation limits. Surfaces which are not within these limits shall be removed and replaced at no additional cost to District; patching is not acceptable. Keep surface moist with fine fog spray of water to prevent drying during finishing operations and until curing media is applied. Dusting with cement or sand during finishing operations is not permitted.

- A. Precautions. Slabs have not been designed for heavy construction loads. Contractor shall repair or replace damaged slabs resulting from his use of heavy equipment or loadings as directed by the Engineer.

- B. Rough Slabs. Broom surfaces of slab after initial set of concrete leaving coarse aggregate slightly exposed. Apply on following areas and surfaces:
1. Concrete to receive deferred concrete, grout or mortar.
 2. Tops of footings for masonry.
- C. Monolithic Trowel Finish. For all floor, slab, and flatwork surfaces not otherwise indicated or specified. After surface water disappears and floated surface is sufficiently hardened, steel trowel and retrowel to smooth surface. After concrete has set enough to ring trowel, retrowel to a smooth uniform finish free of trowel marks or other blemishes. Avoid excessive troweling that produces burnished areas.
- D. Steel Float Finish. Same as monolithic trowel finish, except omit second retroweling. Apply on following area and surfaces:
1. Apply on floor slab surfaces in water-bearing structures.
 2. Areas scheduled to receive resilient floor coverings.
- E. Swirl Non-Slip Finish. Prepare same as steel float finish, then perform final troweling with circular motion and slightly lift trowel to produce uniform swirl (sweat trowel) non-slip finishes matching sample selected by District from Contractor-prepared 2-foot square sample panels. Unless otherwise specified, provide uniform coarse texture on exterior walking surfaces.
- F. Wood Float Finish. Float to screeds. When ready, finish with wood floats to a uniformly textured surface. Apply on following areas and surfaces:
1. Exterior walking surfaces exceeding 1:10 slope.
- G. Floor Hardener Application
1. Floor hardener shall be applied by dust-on method to all interior exposed concrete floors, and to other specifically designated floors using specified materials and rates of coverage.
 2. Prior to application, the Contractor shall consult with the manufacturer's field representative in regard to application of floor hardener under prevailing job conditions.
 3. Float and trowel floor hardener into the surface of freshly floated concrete floors shall be in strict accordance with the manufacturer's printed instructions.

4. Cure as work progresses using method conforming to hardener manufacturer's printed directions.

3.11 CURING SLABS AND FLATWORK

Apply curing media as soon as feasible after finishing operations without marring surfaces, and in any case on same day. Keep surfaces moist until curing is applied. Upon approval of liquid compounds, apply in strict accordance with material manufacturer's published application rates; apply two (2) spray coats, second coat sprayed at right angle direction from first coat. Carefully mask and protect adjoining surfaces where compound is used.

- A. Curing Period and Protection. Maintain curing materials in proper sealed condition for minimum of 7 days (14 days on projects subject to Federal Wage Determination) after application. Keep traffic on curing surfaces to the minimum possible, and completely off liquid compound cured surfaces. Immediately restore any damaged or defective curing media.
- B. Restriction. Do not use liquid membrane-forming curing compound within water-bearing structures, or on surfaces to receive deferred concrete or masonry, or on surfaces to receive fluid-applied protective coatings or waterproofing.
- C. Liquid Membrane-Forming Curing Compound. Upon approval, and except as restricted above, use liquid curing compound for all slabs, floors, and flatwork. On slabs having floor hardener treatment, cure such slabs in strict conformance with printed recommendations of floor hardener manufacturer. Other special precautions may be required if concrete is exposed to freezing or otherwise adverse weather conditions during the curing period.
- D. Sheet Curing. Use concrete curing sheet material on surfaces where liquid curing is not permitted, and on all joints sealed with pressure sensitive tape; immediately repair any tears during curing period. Verify that surfaces remain damp for full curing period; if necessary or directed, lift sheeting and wet surfaces with clean water, and replace sheeting.
- E. Water Curing. Alternate to either liquid curing compound or sheet curing method where approved. Keep concrete continuously wet by ponding, sprinklers, or equivalent for entire curing period.

3.12 FORMED STAIRS AND TREADS

Stair nosings are required on all stairs. Accurately place cast abrasive nosings and screed tread surface flush and level. Cut riser back as indicated. At exterior and wet interior locations, apply coarse textured swirl non-slip abrasive finish on surface of treads and landings. Strip protective tape from the nosings on completion of cement finishing operations.

3.13 CHAMFERS AND FILLETS

Unless otherwise shown on the drawings or directed by the Engineer, exposed edges of formed concrete structure shall be provided with a 45°, 3/4 inch x 3/4 inch chamfer. Where fillets are shown on the drawings, they shall be formed with a 45°, 3/4 inch x 3/4 inch form chamfer, formed with a 3/8 inch radius form, or tooled with a 3/4 inch radius rounding tool. Where project is an expansion of an existing facility, chamfer selected shall be compatible with chamfer of existing facility.

3.14 JOINTS WITH SEALANT

Sandblast joints to clean sound concrete, using oil-free air to provide surfaces free of oil, foreign materials, and moisture. Mix and place primer, and sealant in accordance with manufacturer's printed instructions. Install foam backing in joints so sealant depth is between one-half and two-thirds of joint width. Isolate backing from sealant using a bond breaker such as polyethylene tape, aluminum foil, or wax paper.

- A. Manufacturer's Supervision. A technical representative of the sealant manufacturer shall be present at the time sealant operations are started to supervise and approve preparation, sealant mixing, and sealant applications procedures and applicators. The representative shall make frequent visits to the site to ensure that sealant installations conform to the manufacturer's instructions, and shall issue a written report to District covering each visit.
- B. Crack Sealing. Before and after backfilling of the tanks, all cracks over 0.01 inch wide in concrete surfaces of tanks and other water-containing structures shall be cutout as detailed and the groove filled with backing, primer, and sealant.
- C. Joint Sealer. Unless specified otherwise, IGAS type joint sealer shall be used where joint depth is equal to or greater than twice the joint width. Colma type joint sealer shall be used where the depth to width ratio is less than 2:1.
- D. Sealant. All sealant shall be placed in strict accordance with the manufacturer's printed specifications by a firm specializing in this type of work for not less than five (5) years, or by the Contractor under direct supervision of the manufacturer's representative.
- E. Sealant Locations. All locations where sealant is placed must be cleaned by sandblasting and be free from oil, foreign materials, and moisture. Lower surfaces of joints shall be isolated with a bond breaker such as polyethylene, wax paper, aluminum foil or polyethylene tape.

3.15 INSTALLATION OF PIPELINES THROUGH CONCRETE STRUCTURES

- A. Whenever a pipeline or any material terminates or extends at or through a structural wall or sump, the Contractor shall install in advance of pouring the concrete the fitting or special casting required for the particular installation. Otherwise, prepare and submit shop/erection drawings of other installation methods and obtain approvals in advance of commencement of work.
- B. Whenever any run of pipe is installed per approved shop/erection drawings subsequent to placing of concrete, the Contractor shall accurately position the opening in the concrete for such pipelines. Unless otherwise required, all pipes penetrating fluid containing or earth-supporting portions of the structure shall be ring flanged.
 - 1. Opening shall be of sufficient size to permit a perfect final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory packing where pipe passes through wall to insure watertightness around openings so formed.
 - 2. The boxes or cores shall be provided with continuous keyways to hold the filling material in place and to insure a watertight joint.
 - 3. Boxes or cores shall be filled with nonshrink grout or nonshrink concrete.

3.16 FIELD QUALITY CONTROL

- A. Concrete Tests. At District's expense, District's selected Testing Laboratory shall perform the concrete tests:
 - 1. Compression Tests. Make one set of at least four standard test cylinders from each day's placing and each 50 cubic yards, or fraction thereof, for each class of concrete. Date cylinder, number and tab, indicating location in structure from which sample was taken. Indicate slump test result of sample. Do not make more than one set of test cylinders from any one location or batch of concrete.
 - 2. Test Cylinders. Provide for testing by District or Testing Laboratory to take test cylinders at the job in accordance with ASTM C31. Test specimens in accordance with ASTM C39 at the age of 7 and 28 days. Contractor shall furnish labor and assistance for casting test cylinders, and shall furnish moist curing cabinets, as required, conforming to ASTM C31 at the site.

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3. Core Tests. Should strength of concrete, as indicated by tests, fall below required minimum, then additional tests of concrete which the unsatisfactory samples represent may be required by District. Testing Laboratory will make such test in accordance with ASTM C42. Contractor shall fill the holes made by cutting cores with dry pack concrete. Tests for below-strength concrete shall be paid for by the Contractor even though such tests indicate the concrete has obtained the required minimum compressive strength.
4. Air Content. At time that compression test cylinders are cast, test a sample of the same concrete for air content in accordance with ASTM C231.

3.17 WATERTIGHTNESS OF CONCRETE STRUCTURES

- A. All concrete structures designed to contain or convey fluid shall be tested for watertightness by the Contractor by filling with water to levels approximating what will be attained during operation and measuring the drop in level due to leakage, if any. These tests shall be made under the direction of the District, and if necessary, the tests shall be repeated until watertightness is insured.
- B. Rate of filling shall be limited to minimize shock-effect to new concrete construction. Water shall be held under each condition long enough to satisfy the District that the structures are watertight. Structures shall be free of internal or external water leakage.
- C. The total loss of water-level in any basin or flume shall not exceed 1/2 inch depth in 24 hours. Leakage shall be located and stopped and the structure again tested until this requirement is met. If the structure does not meet the test, the Contractor shall repair or replace at his own expense, such part of the work as may be necessary to secure the desired results, as approved by the District.
- D. Regardless of the rate of leakage, there shall be no visible leakage from any concrete structure.

3.18 ALTERATIONS AND REWORK

Existing concrete surfaces to receive new concrete shall be heavily sandblasted to expose coarse aggregate and produce clean coarse textured surface. Such prepared surfaces shall be coated with epoxy bonding compound immediately prior to placing concrete. The compound shall be an approved equivalent to Sika Chemical Company's "Sikastix Adhesive", Hunt Process Company's "HB Series Epoxy Mortar", or equal of type, mix and application in strict accordance with manufacturer's printed recommendations and directions for various conditions.

3.19 REMOVAL OF EXISTING CONCRETE, MASONRY, OR GROUT

Contractor shall utilize necessary equipment and techniques to remove specified concrete, masonry, and grout without damaging or affecting the integrity of the remaining material. Upon removal to the specified limits, any exposed reinforcing steel, anchor bolts, or other embedded items, shall be chipped, cut, or ground to not less than 2 inch depth from the remaining surface.

Remaining holes and cavities shall be repaired as follows:

- A. Perimeter of holes or cavities shall be cut back to trueline a minimum depth of 1/2 inch. Edges shall be feathered.
- B. Surfaces of holes or cavities shall be roughened by mechanical means to provide an aggregate-fractured surface with a 1/4 inch (minimum) profile and cleaned of a loose material and dust.
- C. A bonding agent shall be applied to all hole or cavity surfaces immediately prior to filling with repair mortar. The bonding agent shall be Sika Corporation's "Armatec 110", Hunt Process Company's "HB Series Epoxy Mortar", or equal.
- D. Holes and cavities shall be filled with Sika Corporation's "MonoTop 611" mortar, or equal. For placement greater than 3 inches in depth, 3/8 inch aggregate shall be added to the mortar to create a repair concrete. Vertical surfaces shall be formed. Horizontal surfaces, including slab overlays, shall be hand trolled and finished to match adjacent concrete.
- E. Bonding agent and repair mortar/concrete shall be mixed and installed in strict accordance with the manufacturer's printed instructions.

3.20 QUALITY OF WORK

Concrete work which is found to be in any way defective or out of tolerance may be ordered by the District to be removed and replaced. Should this occur, all costs shall be paid by the Contractor.

END OF SECTION 03300

Revised 10/99

SPECIFICATIONS - DETAILED PROVISIONS
Section 09810 - Tape Wrap for Insulated Joints

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SECTION 09810
TAPE WRAP FOR INSULATED JOINTS

PART 1 - GENERAL

1.01 DESCRIPTION

Wrap edges of flange joints to protect the edge of the gasket from water intrusion.

1.02 SUBMITTAL

Submit catalog data on primer and tape wrap.

PART 2 - PRODUCT

2.01 PRIMER AND TAPE WRAP

Primer shall be as recommended by the tape manufacturer. The tape shall be manufactured for corrosion protection of underground steel or iron pipe and shall have an adhesive inner layer and an outer layer for mechanical protection with a combined thickness of at least 35 mil and a width of 2 inches. Use Protecto Wrap 200, Tek-Rap, Inc. 280 joint wrap tape, or equivalent.

PART 3 - INSTALLATION

3.01 PRIMER AND TAPE WRAP

Clean edge of both flanges of all dirt, rust, and foreign matter with a wire brush. Apply primer to the clean surface, then apply tape, centered over the gasket, per manufacturer's.

END OF SECTION 09810

SPECIFICATIONS - DETAILED PROVISIONS
Section 09900 - Painting and Protective Coatings

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**SECTION 09900
PAINTING AND PROTECTIVE COATINGS**

PART 1 - GENERAL

1.01 SCOPE

Requirements of Conditions of Contract and Division 1 apply to this Section. Provide all labor, materials, apparatus, scaffolding, and all appurtenant work in connection with painting and protective coatings, complete as indicated, specified and required.

A. Work Included in This Section. Principal items include:

1. All exposed piping, conduits, ducts and other metal surfaces, interior and exterior, except as hereinafter specifically excluded.
2. All submerged and intermittently submerged metal surfaces, except stainless steel.
3. All structural and miscellaneous steel, including tanks.
4. The interior of wet wells, headworks, manholes, junction structures, transition stations and similar structures.
5. Exterior above-ground concrete and concrete block as specified and shown on the Drawings.
6. The interior and exterior of structures as specified in the Painting Schedule and shown on the Drawings.
7. Equipment furnished with and without factory finished surfaces.
8. Equipment on which factory applied finishes have been marred, abraded, scratched, nicked, or otherwise damaged.
9. Exterior and interior concrete, concrete unit masonry, cement plaster, doors, frames, sheet metal surfaces and other architectural work as specified and shown on the Drawings.
10. The Contractor shall furnish to the Owner, at no charge for use during this project, the necessary dry film thickness gages and electrical flaw or holiday detection equipment.
11. Protective coating of submerged and intermittently submerged concrete and masonry surfaces, except portion of such surfaces designated to receive waterproofing.

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12. Recoating of existing interior and exterior painted surfaces from architectural break where damaged or altered in performance of Work of this General Contract.

B. Related Work Not Included in This Section. The following surfaces, in general, shall not be painted:

1. Concrete surfaces subject to pedestrian or vehicular traffic except as herein specified.
2. Plastic surfaces and fiberglass reinforced plastic (FRP) surfaces, except as specified for identification purposes.
3. Nonferrous metals and stainless steel unless otherwise noted or indicated. Galvanized metal shall not be coated unless specified otherwise.
4. Mechanical equipment with factory finish as specified herein.
5. Electrical and instrumentation equipment with approved factory finish as indicated herein.
6. Waterproofing, dampproofing and roof covering Work.
7. Pavement stripping and marking as specified elsewhere in these Specifications.
8. Existing painted surfaces which are not within areas of alterations performed under this General Contract unless such surfaces are damaged in performance of Work of this General Contract.

C. In no case shall any concrete, wood, metal, or any other surface requiring protection be left unpainted or uncoated even though not specifically defined herein.

1.02 GUARANTEE

A two (2) year guarantee which commences on the date of acceptance against failure of all coatings shall be provided. Failure of any coating during the guarantee period shall be repaired by the Contractor who shall absorb all costs related to the repair of the coating.

As part of this two (2) year guarantee, the Contractor shall perform an inspection of all painted surfaces at eleven (11) months from date of acceptance with an Owner's representative. All coating failures shall be repaired. The costs of this inspection and any repair services shall be the Contractor's responsibility.

1.03 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications, all cleaning, surface preparation, and coating shall conform to the applicable requirements of the referenced portions of the standards specified herein to the extent that the requirements therein specified are not in conflict with the provisions of this Section.
- B. Unless otherwise specified, all work and materials for the preparation and coating of all metal surfaces shall conform to the applicable requirements specified in the Steel Structures Painting Manual, Volume 2, Systems and Specifications, latest edition, published by the Steel Structures Painting Council.
- C. The following referenced surface preparation specifications of the Steel Structures Painting Council shall form a part of this Section.
 - 1. White Metal Blast Cleaning (SSPC-SP5-63). Removal of all visible rust, mill scale, paint, and foreign matter by blast cleaning by wheel or nozzle (dry) using sand, grit, or shot. (For very corrosive atmosphere.)
 - 2. Near-White Blast Cleaning (SSPC-SPI0-63T). Blast cleaning nearly to White Metal Cleanliness, until at least 95 percent of each element of surface area is free of all visible residues. (For high humidity, chemical atmosphere, marine or other corrosive environment.)
 - 3. Commercial Blast (SSPC-SP6-63). Blast cleaning until at least 67 percent of each element of surface area is free of all visible residues.
 - 4. Brush-Off Blast Cleaning (SSPC-SP7-63). Blast cleaning of all except tightly adhering residues of mill scale, rust and coatings, exposing numerous evenly distributed flecks of underlying metal.
 - 5. Solvent Cleaning (SSPC-SP1-63). Removal of oil, grease, dirt, soil, salts, and contaminants by cleaning with solvent, vapor, alkali, emulsion or steam.
- D. Quality Assurance. Evaluation of surface preparation for ferrous metals will be based upon SSPC-Vis I ASTM Designation D220 and "Standard Methods of Evaluating Degree of Rusting on Painted Steel Surfaces", SSPC-Vis 2 ASTM Designation D 610.

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1. To facilitate inspection, the Contractor shall, on the first day of sandblasting operations, sandblast metal panels to the degree called for in the Specification and as noted above. After mutually agreeing that a specific panel meets the requirements of the Specification, the panel shall be initialed by the Contractor and Inspector and then be coated with a clear, non-yellowing finish. Panels shall be prepared for each type sandblasting specified and shall be maintained and utilized by the Inspector throughout the duration of sandblasting operations.

1.04 COMPLIANCE WITH ENVIRONMENTAL REGULATORY REQUIREMENTS

- A. Contractor shall comply with all current federal, state, and local environmental laws and regulations, including, but not limited to the laws and regulations of the U.S. Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD).

1.05 SUBMITTALS

A. Samples

1. For compliance with these Specifications, the Contractor shall prepare and submit three (3) paint and protective coating samples of each finish, including all coats thereof, to the Owner for review, as specified in Section 01300, "Submittals". The samples shall be clearly marked with the manufacturer's name and product identification, and shall be submitted in sufficient time to allow for review, and, if necessary, resubmittal without causing any delay of the Project.
2. The Contractor, at the beginning of the Project, shall furnish one sq. ft. steel panels to be sandblasted in accordance with the sandblasting specifications and to be coated with a non-yellowing shellac, to be used as the standard for preparation of steel surfaces for the duration of this Project.

B. Coating Materials List

1. The Contractor shall provide eight (8) copies of a paint and coating materials list which indicates the manufacturer and paint number, keyed to the coating schedule herein, for approval of the Owner prior to, or at the time of, submittal of samples required herein.
2. The Contractor shall include with his submittal his protective coating schedule for shop and field coatings of items to receive protection. The schedule shall conform to the specified requirements for surface preparation, priming, and coating for items covered, and shall follow the

same requirements for similar work where such work has not been specifically called-out. No bare ferrous nonworking surfaces shall be omitted from the schedule. Particular care shall be taken to cover in sufficient detail the coating of mechanical joints and other mechanical devices, which shall conform to the recommended practice of the manufacturer of the joint or other mechanical devices.

3. Submittals shall be sufficiently early to permit Owner's review and then Contractor's coordination with affected material and equipment suppliers to assure their use of reviewed shop coats of same manufacture as field coats and compatibility with field applied coats for respective coating system.
 4. Coatings to be used on plastic and fiberglass materials shall be certified as acceptable by all plastic and fiberglass manufacturers whose products are to be coated. Certification copies shall be submitted to the Owner. The Contractor shall be certified in writing by the painting and coating material manufacturers as qualified applicators of their products, and copies of the certification submitted to the Owner.
- C. Product Data Sheets and Material Safety Data Sheets. Contractor shall submit paint and coatings material manufacturers' printed technical data sheets for products intended for use in each of various paint and coating systems. Data sheets shall fully describe material as to its intended use, make-up, recommended surface preparation and application conditions, primers, material mixing and application (including recommended dry mil thickness), precautions, safety and maintenance cleaning directions.

1.06 PROTECTION OF WORK

The Contractor shall be responsible for any and all damage to his Work or the work of others during the time his Work is in progress.

1.07 RIGHT OF REJECTION

The Owner shall have the right to reject all material or Work that is unsatisfactory, and require the replacement of either or both at the expense of the Contractor.

1.08 JOB CONFERENCE

Prior to commencing Work, a pre-job conference shall be held for the purpose of reviewing and clarifying the painting and coating requirements of the Project.

The Owner, Contractor, Applicator, Coatings and Paint Manufacturers, and the Inspector shall be present. A schedule of work to be accomplished will be established.

PART 2 - PRODUCTS

2.01 GENERAL

Surfaces to receive paint protective coating materials as herein specified in this Section shall be coated in conformance with the applicable coating systems specified herein. All materials specified by name and/or manufacturer or selected for use under these Specifications, shall be delivered unopened at the job site in their original containers and shall not be opened until inspected by the Owner. Whenever a manufacturer's brand name is specified, it is intended to define the general type and quality of paint or coating desired. Other coatings or paints of equal quality may be used.

Coating materials shall be as specified herein or approved equal. Architectural paint finishes are specified hereinafter. All paint and coatings shall be produced and applied as herein called for, or, if not specifically called for, it shall be applied in accordance with the manufacturer's printed recommendations as reviewed by Owner. So far as possible, all paint and coating materials shall be provided by a single source supplier.

2.02 PAINT AND COATING MATERIALS

- A. **Definitions.** The term "coating materials", as used herein, shall include enamels, paints, sealers, epoxy resins, stains, and all other paints and protective coatings, excepting galvanizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.

- B. **General**
 - 1. Paint and protective coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Pigmented paints shall be furnished in containers not larger than five (5) gallons. Materials shall conform to the specifications shown herein and to the requirements hereinafter specified.

 - 2. Products shall be standard for recognized manufacturer engaged in production of such materials for essentially identical or similar applications in the water and wastewater treatment industry and industrial plants.

- C. **Compatibility.** Only compatible materials shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, subject to review of the Owner, a compatible barrier coat shall be applied between all existing prime coats and subsequent field coats to ensure compatibility.

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2.07 SERVICE CONDITION E

Concrete surface subject to corrosive atmosphere and condensation shall be prepared and coated in accordance with the following requirements.

- A. Surface Preparation. All concrete surfaces shall be aged for 30 days prior to application. All surfaces shall be cleaned of all dirt, dust, form oil, curing compounds, and other deleterious compounds. In general, the concrete shall have a slight texture, be free of pockets and cavities, and be tightly adherent, not powdery. All hollow areas, bug holes, honeycombs, and voids shall be blasted clean and filled in accordance with Section 03300. All fins, form marks, protrusion and rough edges shall be ground off to provide a smooth, continuous surface of suitable texture for proper adhesion of coating. Horizontal surfaces shall be etched with a 15 to 20 percent solution of muriatic acid and thoroughly rinsed with clean water. Vertical walls shall be cleaned by brush blasting (NACE #4 or SSPC-SP7-63). Prior to coating, all surfaces shall be tested per ASTM D 4263. All surfaces shall be completely dry before application of the coating. After concrete repair, fill all voids with coating manufacturer's approved epoxy putty or filler.
- B. Application. Application shall be in strict conformance with the manufacturer's recommendations. Allow a minimum of two hours between coats.
- C. Coating System E. First and second coats shall have a minimum dry film thickness of 4.0 mils each. The top coat, minimum dry film thickness shall be 1.5 mils. The total system shall have a minimum dry film thickness of 9.5 mils.

Carboline System:	First Coat - Carboguard 890 Second Coat - Carboguard 890 Top Coat - Carbothane 133HB Satin
Engard System:	First Coat - 460 H.S. Epoxy Second Coat - 460 H.S. Epoxy Top Coat - 428 Urethane Semi-Gloss
Tnemec System:	First Coat - 69 Hi-Build Epoxoline II Second Coat - 69 Hi-Build Epoxoline II Top Coat - 75 Polyurethane Semi-Gloss

2.08 SERVICE CONDITION F

Coating for plastic and fiberglass pipe for purposes of color coding and label stenciling. Coatings to be used for this category shall be certified by the pipe manufacturer to be completely acceptable and non-injurious to the pipe.

- A. Surface Preparation. Lightly sand pipe and wipe with a solvent to degrease and clean surface.

B. Application. Application shall be in strict conformance with manufacturer's printed recommendation.

C. Coating System F. Two (2) coats having a total dry film thickness of 8.0 mils.

Carboline System: Two coats - Carbothane 133HB Satin

Engard System: 460 Chemical Resistant Primer
428 HS Chemical Resistant Urethane

Tnemec System: 135 Chembuild

2.09 SERVICE CONDITION G

Submerged moving parts including cables, chains, gears, pulleys, etc. shall be prepared and coated in accordance with the following requirements.

A. Surface Preparation. All rust, scale, dust, and foreign matter removed by power or hand tool cleaning.

B. Application. Application shall be in strict accordance with manufacturer's recommendation.

C. Coating System G. The system shall have a total thickness of 25 mils and shall consist of the following:

Chevron - E.P. Roller Grease
Texaco - Rust Inhibitive Grease
Engard - 880 Grease Coating

2.10 SERVICE CONDITION H

Ferrous metals requiring a heat resistant coating. To ensure proper coating selection, accurately measure surface temperatures. Surface preparation shall be performed in strict conformance with manufacturer's printed directions and treated surfaces shall be coated as soon as possible to avoid surface contamination. In conformance with printed directions of manufacturer: mix and apply coats of each system; and cure coats before recoating or before run-in to surface operating temperature. Contingent upon expected temperature range, apply one of the following or equal systems, and avoid excessive film buildup.

A. Rust-Oleum Systems:

150-450°F (66-177°C) Temp. Range - 4100 System

300-800°F (149-427°C) Temp. Range - 4200 System

400-1200°F (260-649°C) Temp. Range - 4300 System

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B. Engard Systems:

Ambient to 250°F - 222 HS Finish

460 Chemical Resistant Primer

519 MIL-P-23236 Class 3

Inorganic Zinc Coating

250° to 750°F - 519 MIL-P-23236 Class 3 Inorganic Zinc Coating

750° to 1000°F - 240 TT-P-28 High Temperature Coating

1000° to 2000°F - 540 Fire Shield II

C. Tnemec Systems:

To 150° F - Tneme Gloss System 2-9
Endura-Shield System 70-1
Tneme-Zinc System 90-2
Hi-Build-Epoxyelene System 66-2

To 750°F - Tneme-Zinc System 90-97

To 1200°F - Silicone-Aluminum Systems 39-2

2.11 SERVICE CONDITION I

Coating of concrete and metal surfaces within the extremely corrosive areas as indicated on the Schedule.

- A. Surface Preparation. All concrete surfaces shall be aged for 30 days prior to application. All surfaces shall be cleaned of all dirt, dust, form oil, curing compounds, and other deleterious compounds. In general, the concrete shall have a slight texture, be free of pockets and cavities, and be tightly adherent, not powdery. All hollow areas, bug holes, honeycombs, and voids shall be blasted clean and filled in accordance with Section 03300. All fins, form marks, protrusion and rough edges shall be ground off to provide a smooth, continuous surface of suitable texture for proper adhesion of coating. Horizontal surfaces shall be etched with a 15 to 20 percent solution of muriatic acid and thoroughly rinsed with clean water. Vertical walls shall be cleaned by brush blasting (NACE #4 or SSPC-SP7-63). Prior to coating, all surfaces shall be tested per ASTM D 4263. All surfaces shall be completely dry before application of the coating. After concrete repair, fill all voids with coating manufacturer's approved epoxy putty or filler.

All metal surfaces shall be cleaned in accordance with SSPC-SP.1 All weld surfaces, edges shall be ground to a curve and all spatter removed. Surface shall then be sandblasted in accordance with SSPC-SP10-63T.

- B. Application. Application shall be in strict conformance with the manufacturer's printed recommendations. The applicator shall be a licensed applicator by the coating manufacturer. The finished coating shall be spark tested and all holidays repaired.
- C. Coating System I. Except as otherwise noted, the prime coat on metal surfaces shall have a minimum thickness of 2.0 mils and a maximum thickness of 3.0 mils. The finish coat on a non-abrasive metal surface shall be 30 mils and in an abrasive area shall be 40 mils. The prime coat on concrete surfaces shall have a minimum thickness of 3.0 mils and a maximum thickness of 5.0 mils. A minimum cure time of 12 hours is required. The finish coat on the concrete shall be applied within 36 hours of the application of the primer and should be performed as recommended by the manufacturer. The finish coat shall be 65 mils minimum thickness.

Sancon System or equal

Primer

Concrete - Sancon 100 Epoxy

Steel - United Coatings No. 32

Finish - Sancon 100 Polyurethane

2.12 ARCHITECTURAL PAINT FINISHES

- A. Manufacturer. Unless otherwise noted, products listed below are the products of the Dunn-Edwards Corporation and Sinclair Paints. Reviewed equivalent products of Ameritone Co. will be acceptable.

1. System P-1 - Enamel On Structural Steel Members

Dunn Edward's System:

- First Coat - "Bloc-Rust", rust inhibitive red primer 43-4 (delete on factory primed materials)
- Second Coat - "Lockote" 42-33
- Third Coat - "Endurasheen" semigloss enamel 39 series
- Fourth Coat - "Endurasheen" semigloss enamel 39 series

Sinclair's System:

- First Coat - Red Oxide Primer No. 15
- Second Coat - CorroPrime No. 14
- Third Coat - Sash and Trim Enamel GX22
- Fourth Coat - Sash and Trim Enamel GX22

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2. System P-2 - Concrete Masonry Paint on Concrete Unit Masonry

Dunn Edwards' System:

- First coat - "Hi Build Industrial Epoxy Primer Eff-Stop", W-709
- Second & Third Coats - "Ultrasield" IP-631.

Sinclair's System:

- First coat - CLA5-9 translucent acrylic emulsion primer
- Second & Third Coats - UR22-8 Clear Anti Graffiti Coating

3. System P-3 - Concrete Masonry Paint on Concrete

Dunn-Edwards' System:

- Two Coats - Primer "Evershield" W-701 (100% Acrylic).

Sinclair's System:

- First Coat - 18 Epoprime or 36 Unipoxy
- Second Coat - 1300 Stuc-O-Life

4. System P-4 - Enamel on Galvanized Metal
(On Doors, Frames, and Sheet Metal)

Dunn-Edwards System:

- Pretreatment - Vinyl wash pretreatment, 42-36
- First Coat - "Galvaprime", zinc dust primer 43-3
- Second Coat - "Loc Kote" synthetic body coat 42-23
- Third Coat - "Endurasheen" semi-gloss enamel 39 series

Sinclair's System:

- Pretreatment - Vinyl wash pretreatment, 7113
- First Coat - Corro Prime 14
- Second Coat - Sash & Trim Primer GX22
- Third Coat - Sash & Trim Enamel GX2

5. System P-5 - Enamel on Primed Metal

Dunn-Edwards System:

- First Coat - (over prime) - "Loc Kote" synthetic body coat 42-33
- Second Coat - "Endurasheen" semi-gloss enamel 39 Series

Sinclair's System:

- First Coat - Corro Prime 14
- Second Coat - Sash and Trim Enamel GX22
- Third Coat - Sash and Trim Enamel GX22

6. System P-6 - Semi Gloss Enamel Paint on Interior Concrete Unit Masonry

Dunn Edwards' System:

- First Coat - "Blocfill" Smooth W305
- Second Coat - Decoglo W450
- Third Coat - Decoglo W450

Sinclair's System:

- First Coat - Smooth Block Filler V423-11
- Second Coat - 1400 Sinco Satin II
- Third Coat - 1400 Sinco Satin II

7. System P-7 - Sealer for Unpainted Masonry Surfaces.

A transparent waterproofing sealer shall be applied to all above grade masonry surfaces, with the exception of interior building walls, both smooth face and split face block as shown on plans and in Coating Systems Schedule. The waterproofing shall be Rain Guard Blok-Lok, Chemstop heavy duty waterproofing or approved equal. Apply to dry, clean split faced surface with airless spray. Rate of application shall be a minimum of 40 square feet per gallon for first coat and a minimum of 80 square feet per gallon for second coat and manufacturer's recommendation. The products selected for waterproofing shall comply with AQMD requirements for voc in California.

2.13 MISCELLANEOUS COATINGS

- A. Hydrants, indicator post, traffic posts, guard rails and ladders shall be safety yellow, matching OSHA Safety Yellow Color and using specified Coating System "B".
- B. Handwheels and operating handles of all valves and equipment shall be safety red, matching OSHA Safety Red Color, using, contingent upon exposure, Coating System "B" in non-corrosive atmosphere and Coating System "C" in corrosive atmosphere and high humidity exposures.
- C. Interior pipe insulation shall be finished with solvent paint system equal to Rust-Oleum's primer No. 2764 and "New Color Horizon" finish coat in color selected by Owner. Metal-protected exterior pipe insulation shall be coated with System "B".

2.14 PATCH COAT FOR GALVANIZED SURFACES

All galvanized surfaces which are scratched, marred, or otherwise damaged shall be patched with Carboline's Carbo Zinc II, "Drygalv" by American Solder and Flux Co., Engard 515 Zinc Rich Primer, or approved equal.

2.15 PRIMER OVER BITUMINOUS COATING

Two (2) coats, Rust-Oleum 578I Rust-O-Crylic.

PART 3 - EXECUTION

3.01 MANUFACTURER'S RECOMMENDATIONS

Unless otherwise specified herein, the paint and coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protection of his coating materials; for preparation of surfaces for coating; and for all other procedures relative to coating shall be strictly observed. No substitutions or other deviations shall be permitted without written permission of the Owner.

3.02 DELIVERY AND STORAGE

Materials shall be delivered in manufacturer's original, sealed containers, with labels and tags intact. Coating materials and equipment shall be stored in designated areas. Coating containers shall be opened only when required for use. Coatings shall be mixed only in designated rooms or spaces in the presence of the

Owner's Representative. Coating shall be thoroughly stirred or agitated to uniformly smooth consistency and prepared and handled in a manner to prevent deterioration and inclusion of foreign matter. Unless otherwise specified or reviewed, no materials shall be reduced, changed, or used except in accordance with the manufacturer's label or tag on container.

3.03 SAFETY REQUIREMENTS

In accordance with the requirements of the latest revision of the California Administrative Code Title 8 Construction Safety orders enforced by the California Department of Occupational Safety and Health (CAL OSHA), and applicable OSHA Regulations for Construction, the Contractor shall provide and require the use of personal protective lifesaving equipment for all persons working in or about the Project site.

- A. Protective Equipment. Respirators shall be worn by all persons engaged in, and assisting in, spray painting. In addition, workers engaged in or near the Work during sandblasting shall wear eye and face protection devices meeting the requirements of ANSI Z87.1 latest revision, and approved OSHA Regulations for sandblasting operations and approved air-purifying, half-mask or mouthpiece respirator with appropriate filter.
- B. Ventilation. Where ventilation is used to control potential exposure to workers as set forth in Section I910.94 of the OSHA Regulations for Construction, ventilation shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation shall meet the requirements set forth in ANSI Z9.2, latest revision.

- C. Sound Levels. Whenever the occupational noise exposure exceeds the maximum allowable sound levels as set forth in Table D-2, Permissible Noise Exposures, in Section 1926.52, of the OSHA Regulations for Construction, ear protective devices shall be furnished and used. Ear protective devices inserted in the ear shall be fitted or determined individually, by competent persons. Plain cotton is not an acceptable protective device.
- D. Storage and mixing of coating materials shall be performed only in those areas designated by the Owner.
- E. Cloths and cotton waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each work day.

3.04 STORAGE, MIXING, AND THINNING

Paint and coating materials shall be protected from exposure to cold weather, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Materials of different manufacturers shall not be mixed together. Packaged materials may be thinned immediately prior to application in accordance with the manufacturer's directions.

3.05 WORKMANSHIP

- A. Skilled craftsmen and experienced supervision shall be used on all Work.
- B. All paint and coatings shall be applied in a workmanlike manner so as to produce an even film of specified uniform thickness. Edges, corners, crevices, and joints shall receive special attention to ensure that they have been thoroughly cleaned and that they receive an adequate thickness of paint. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. The hiding shall be so complete that the addition of another coat of paint would not increase the hiding. All coats shall be applied so as to produce a film of uniform thickness. Special attention shall be given to ensure that edges, corners, crevices, welds, and similar areas receive a film thickness equivalent to adjacent areas, and installations shall be protected by the use of drop cloths or other approved precautionary measures. Rough exterior cement plaster shall be spray painted.

3.06 PREPARATION FOR PAINTING AND PROTECTIVE COATING

All surfaces to receive paint and protective coatings shall be cleaned as specified herein prior to application of coating materials. The Contractor shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. Beginning the Work of this Section without reporting unsuitable conditions to the Owner constitutes acceptance of conditions by the Contractor. Any required removal, repair, or replacement of the Work caused by unsuitable conditions shall be done at no additional cost to the Owner. All marred or abraded spots on shop-primed and factory-finished surfaces shall receive touch-up restoration prior to any other coating application.

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3.07 ITEMS NOT TO BE COATED

Hardware, hardware accessories, nameplate data tags, machined surfaces and similar items in contact with coated surfaces not to be coated shall be removed or masked prior to surface preparation and painting operations. Following completion of coating of each piece, removed items shall be reinstalled. Such removal and installation shall be done by workmen skilled in the trades involved.

3.08 SANDBLASTING

- A. All sandblasting shall be done in strict accordance with the referenced specifications of the Steel Structures Painting Council.
- B. When items are to be shop primed or shop primed and finish coated in the shop, surface preparation shall be as specified in this Section. The Owner shall have the right to witness, inspect, and reject any sandblasting done in the shop.
- C. When sandblasting is done in the field, care shall be taken to prevent damage to structures and equipment. Pumps, motors, and other equipment shall be shielded, covered, or otherwise protected to prevent the entrance of sand. No sandblasting may begin before the Owner inspects and reviews the protective measures.
- D. After sandblasting, dust and spent sand shall be removed from the surfaces by brushing or vacuum cleaning.

3.09 APPLICATION OF ARCHITECTURAL PAINT FINISHES

Perform surface preparation, material mixing and application (including dry-mil thicknesses) for each "Architectural Paint Finish System" in strict conformance with submitted and approved material manufacturers' printed recommendations.

A. Surface Preparation

1. General.

- a) Before priming, correct all finish surfaces which are not properly prepared, sandpapered and cleaned or which are not in proper condition to receive finish specified. Do no priming until surfaces are approved.
 - b) Prior to surface preparation and painting operations, remove or protect all hardware, hardware accessories, plates, lighting fixtures and similar items in contact with painted surfaces and not to be painted.
 - c) Program cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
2. Clean concrete and masonry surfaces of all dirt, encrustations, efflorescence and other foreign matter. Roughen glazed surfaces on concrete.

3. Clean ferrous metal not provided with a shop prime of rust, mill scale, oil, grease and foreign matter by wire brushing, scraping or sandblasting as necessary. Clean ferrous metal provided with shop prime of oil, grease and foreign matter. Prime scratched and abraded areas with No. 15 Chrome Oxide Primer.
4. Clean galvanized metal with mineral spirits and pretreat with Sinclair's No. 7113 Vinyl Wash Primer. Prime cleaned and pretreated galvanized metal with Sinclair's No. 25 Zinc Dust Primer the same day that cleaning has been performed.
5. Clean gypsum board (drywall) of all dust, dirt, encrustations and foreign matter.

B. Application

1. Apply material evenly, free from sags, runs, crawls, holidays or defects. Mix to proper consistency, brush out smooth leaving minimum of brush marks, enamel, and varnish uniformly flowed on.
 - a) Sand and dust between each coat to remove defects visible from a distance of five feet.
 - b) Finish coats shall be smooth, free of brush marks, streaks, laps or pile up of paints, and skipped or missed areas. Finished metal surfaces shall be free of skips, voids or pinholes in any coat when tested with a low voltage detector.
 - c) Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
 - d) Rate of application shall not exceed that as recommended by paint manufacturer for the surface involved less ten percent allowance for losses.
 - e) Keep brushes and spraying equipment clean, dry, free from contaminants and suitable for the finish required.
2. Apply paint by brushes, roller or spray.
3. Tint all pigmented undercoats to approximately same shade as final coat. Perceptibly increase the depth of shade in successive coats.
4. Allow each coat to dry thoroughly before succeeding coat application. For oil paints, allow at least 48 hours between coats of exterior work, except where otherwise recommended by the manufacturer.

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5. Finish all four edges of doors with the same number and kind of coatings as specified for their main surfaces. Where openings into rooms having different finishes, finish door edges as directed.
6. Do not paint factory finished items unless specifically directed.
7. Paint surfaces of metal ducts and vents.
8. Apply two finish coats of paint to shop primed metal surface of all mechanical and electrical equipment, to match adjoining wall or ceiling surfaces. In addition to above, prime coat all unprimed surfaces. Principal items of this Work include interior of hose cabinets, air grilles, ceiling diffusers, electric panels, telephone panels, access panels, conduit, outlet and pull boxes, ducts and pipes.
9. Miscellaneous Painting: Paint surfaces to be painted and not specifically described herein, with a product specifically manufactured or prepared for the material and surface; prime coat and two finish coats.
10. Upon completion, remove all rubbish caused by this trade. Remove spots from floors, glass and other surfaces. Leave in a clean and orderly condition.
11. At the completion of other trades, touch up damaged surfaces as required.

3.10 APPLICATION OF PROTECTIVE COATINGS

- A. Shop Coating. Fabricated metalwork and equipment which requires coating may be shop primed before fabrication with specified primer. Any such work delivered to the job site with any other shop coat shall have this coating removed and the specified coating applied in the field. Manufactured equipment with approved corrosion resistant factory finishes and galvanized finishes shall be exempt from this requirement.
- B. Application of Field Coatings
 1. Except where in conflict with the manufacturer's printed instructions, or where otherwise specified herein, the Contractor may use brush, roller, air spray, or so-called airless spray application; however, any spray painting must first have the approval of the Owner. Rollers for applying enamel shall have a short nap. Areas inaccessible to spray coating or rolling shall be coated by brushing or other suitable means.
 2. The Contractor shall give special attention to the Work to ensure that edges, corners, crevices, welds, bolts, and other areas, as determined by the Owner, receive a film thickness at least equivalent to that of adjacent coated surfaces.

3. All protective coating materials shall be applied in strict accordance with the manufacturer's printed instructions.
4. Prime coat shall be applied to all clean surfaces within a four hour period of the cleaning, and prior to deterioration or oxidation of the surface, and in accordance with the manufacturer's recommendations. Drift from sandblasting procedures shall not be allowed to settle on freshly painted surfaces.
5. All coatings shall be applied in dry and dust-free environment, and unless otherwise directed by the Owner, shall not be applied when the air temperature or the temperature of the surface to be painted is outside the range of 50 degrees F to 90 degrees F.
6. Each coat shall be applied evenly, at the proper consistency, and free of brush marks, sags, runs, and other evidence of poor workmanship. Care shall be exercised to avoid lapping paint on glass or hardware. Coatings shall be sharply cut to lines. Finished coated surfaces shall be free from defects or blemishes. Protective coverings shall be used to protect floors, fixtures, and equipment. Care shall be exercised to prevent paint from being spattered onto surfaces from which such paint cannot be removed satisfactorily. Surfaces from which paint cannot be removed satisfactorily shall be painted or repainted as required to produce a finish satisfactory to the Owner. Whenever two (2) coats of a dark colored paint are specified, the first coat shall contain sufficient powdered aluminum to act as an indicator of proper coverage, or the two (2) coatings shall be of a contrasting color.
7. Interior surfaces of roof plates, roof rafters, and supports, and all contact surfaces inaccessible after assembly, shall be coated before erection; however, no structural friction connections or high tensile bolts and nuts shall be painted before erection. Areas damaged during erection shall be hand or power-tool cleaned and recoated with prime coat.
8. Touch-up of all surfaces shall be performed after installation.
9. All surfaces to be coated shall be clean and dry at the time of application.

C. Time of Coating

1. Sufficient time shall be allowed to elapse between successive coats to permit satisfactory recoating, but, once commenced, the entire coating operation shall be completed without delay. No additional coating of any structure, equipment, or other item designated to be painted shall be undertaken without specific permission of the Owner until the previous coating has been completed for the entire structure, piece of equipment, or other item.

2. Piping shall not be finish coated until it has been pressure-tested and approved.
- D. Thickness of Coating. The dry film mil-thickness specified shall be achieved and verified for each coat.

3.11 TESTING AND INSPECTION

- A. Inspection Devices. The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coatings and paints. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test the accuracy of dry-film thickness gauge and certified instrumentation to test accuracy. Dry-film thickness gauges shall be made available for the Inspector's use at all times until final acceptance of application. Holiday detection devices shall be operated in the presence of the Inspector. Inspection devices shall be operated in accordance with the manufacturer's instructions at the direction of the Owner or the Owner's Representative.
- B. The Contractor shall conduct film thickness measurements and electrical inspection of the coated surfaces with equipment furnished by him and shall recoat and repair as necessary for compliance with the Specifications.
- C. After repaired and recoated ferrous metals areas have cured, final inspection tests will be conducted by the Owner or the Owner's Representative. Coating thicknesses specified in mils on ferrous substrates will be measured with a nondestructive magnetic type dry-film thickness gauge such as the Elcometer, manufactured by Gardner Laboratories, Inc. Discontinuities, voids and pinholes in the coatings will be determined with a nondestructive type electrical holiday detector. Epoxy coatings and other thin film coatings will be checked for discontinuities and voids with a low voltage detector of the wet-sponge type, such as Model MI as manufactured by Tinker and Razor. Use a non-sudsing type wetting agent, such as Kodak Photo-Flo, which shall be added to the water prior to wetting the sponge. A high voltage, low current, spark type detector such as Model EP, manufactured by Tinker and Razor, will be used for electrical inspection of only coat tar enamel. Tape type coatings will be inspected for holidays using a device designed for use in detecting such flaws. All pinholes shall be marked, repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted. Wide film thickness discrepancies shall be measured and verified with a micrometer or other approved measuring instrument. Coatings not in compliance with the Specifications will not be acceptable and shall be replaced and reinspected at Contractor's expense until the Specifications are met.

- D. On non-ferrous surfaces, dry film thickness readings shall be taken at random locations with a Tooke Gauge at the rate of approximately five readings per 100 square feet of surface. Groove cut into coating shall be repaired by application of all coats of paint or coating film being tested. The average of all readings for a given area or surface shall be within required dry film thickness range and no individual reading shall be more than 20 percent below the recommended dry film thickness. Any areas that are found to be below standard shall be marked and recoated to obtain proper film thickness.
- E. Warranty Inspection. Warranty inspection shall be conducted during the eleventh month following completion of all coating and painting Work. All personnel present at the Pre-Job Conference shall attend this inspection. All defective Work shall be repaired in accordance with this Specification and to the satisfaction of the Owner or his appointed representative.

3.12 CLEAN UP

- A. Upon completion of the Work, staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner. Paint spots, oil, or stains upon adjacent surfaces shall be removed.
- B. The Contractor shall clean the site in accordance with the requirements for "Cleaning Up" in the General Conditions.

3.13 PAINT AND COATING SCHEDULE

- A. General. The following schedule shall indicate the coating system to be used. The list shall not be construed as a complete list of all surfaces to be coated but rather as a guide as to the application of the various coating systems. All surfaces shall be painted except those specifically deleted herein. The Owner shall select the colors. Where reference is made to ferrous metal in this schedule, it shall not include stainless steel.
- B. Color Identification. All exposed and/or unburied pipe, including steel, copper and brass tubing, galvanized pipe, polyvinyl chloride pipe, fiberglass reinforced pipe, and stainless steel pipe, shall be identified by color to show its use/function. Color bands of an approved tape type may be used on PVC, FRP, and stainless steel pipe and all other pipe not readily susceptible to painted finish. Bands shall be adhesive type with extra strength and suitable for continuous duty at 250 degrees F. All markers shall have a protective silicone film.

COLOR CODE SCHEDULE

Item	Color Code	Label
Aeration Air	Light Green	AA
Belt Press Return Water	Gray	BPRW
Building Drain	NA	BD
Compressed Air	Light Green w/Yellow	CA
Chlorinated Effluent	Blue	CE
Chlorine Gas	Yellow/Green Band	CG
Chlorine Solution	Yellow	CS
Cold Digested Sludge	Brown	CSL
Diesel Fuel	Yellow	DF
Digested Sludge	Brown	DSL
Digested Sludge Transfer	Brown	XSL
Digester Gs	Red	DG
Drain	NA	D
Electrical Panel (within bldg)	ANSI 61 - Gray	--
Electrical Conduit and Equipment (except panels)	White (Sherwin Williams F65W1)	--
Engine Coolant Water	Blue	ECW
Froth Spray	Blue	FS
Flotation Thickener Overflow	NA	FTO
Fresh Water	Light Blue	FW
Gravity Thickener Overflow	Gray/Yellow Bands	GTO
Grit	Brown	GRIT
Grit Washer Overflow	Gray	GWO
Ground Water Drain	NA	GWD
Heated Digested Sludge	Brown/Yellow Bands	HSL
High Temperature Water	Blue/Yellow Bands	HTW
Irrigation Water	NA	IW
Low Temperature Water	Blue/Orange Bands	LTW
Natural Gas	Light Yellow	NG

COLOR CODE SCHEDULE
(continued)

Item	Color Code	Label
Oil Lines	Black	Oil
Polymer	Light Blue/Yellow Bands	POLY
Primary Tank Drain	Brown	PTD
Primary Sludge	Brown	PSL
Primary Scum	Brown	PSK
Raw Sewage	Brown	S
Return Digested Sludge	Brown	RDS
Return Water	Gray	RW
Secondary Scum	Brown	SSK
Sludge Bed Drain	NA	SBD
Sludge Heater Bypass	Brown	SLHB
Storm Water Drainage	NA	SWD
Thickened Sludge	Brown	TS
Thickener Dilution Water	Blue	TDW
Waste Activated Sludge	Brown	WAS
Waste Digested Sludge	Brown	WDS
Wash Water	Red	WW

Architectural System	Descriptive Color Code	Manufacturers' Paint Designation
PLANT BUILDINGS:		
General Surface	Tan	Rustoleum #865 (Dunes Tan)
Trim & Doors	Dark Brown	Rustoleum #977 (Chestnut Brown)
Walls (metal)	Yellow-White	Dunn-Edwards #CH-60B (Parchment)

Painting and Protective Coatings
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Both the direction of fluid flow, and the name of the fluid in the pipe shall be stenciled on all pipe at least once every twenty-five (25) feet and at every change of direction. Color bands shall be spaced at fifteen (15) foot intervals and every change in direction. The size of the letters and color bands shall be as specified in the table below:

Outside Diameter Pipe or Covering	Width of Color Band	Height of Legend Letters
1/4 to 1-1/4	1	1/2
1-1/2 to 2	1	3/4
2-1/2 to 6	6	2
8 to 10	6	2-1/2
Over 10	6	3-1/2

All dimensions are given in inches.

The stenciled labels shall be abbreviated and conform to the piping abbreviations shown on Color Code Schedule. The labels shall be safety yellow, matching OSHA Safety Yellow. Engines and herein listed electrical items shall be color coded as follows:

White:	Sherwin Williams F65W1 Electrical (Excluding panels)
Gray:	ANSI 61 Electrical panels
Light Yellow:	(EMWD) Engines

- C. Process Valve Identification. After the painting of process piping is complete, the Contractor shall stencil the tag numbers, as supplied by the Owner, of all valves on the pipe adjacent to the valve for pipe 2 inches and over. Characters shall be one inch high minimum and shall be oriented to be visible from the valve operating position. When the valve has extended operator shaft or chain operator, the number shall be placed both at the operating position and at the valve if practicable. The latter requirement does not apply if the valve is buried or in a pit. Valves in pipes under 2 inches shall have characters as large as the pipe will permit or at the Owner's option, on an adjacent surface. Characters shall be preferably white; however, if this would not provide sufficient contrast to the pipe, the Owner may select another color. Paint used shall be of the same type and quality as used for painting the pipe.

END OF SECTION 09900

Revised 09/85

SPECIFICATIONS - DETAILED PROVISIONS
Section 09940 - Epoxy Coating

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**SECTION 09940
EPOXY COATING**

PART 1 - GENERAL

1.01 REQUIREMENT

Where specified or shown, an epoxy coating shall be applied as specified herein.

PART 2 - PRODUCTS

2.01 MATERIAL

The material used shall be 100 percent (100%) powder epoxy and shall be Dow Corning DC 3100, Furane Plastics Co. No. 268, Three-M Company "Scotchcoat," Michigan Chrome and Chemical Company "Micron 650 or 651," or approved equal.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

The surface shall be blast-cleaned in accordance with SSPC-SP-5 (White Metal Blast Cleaning). The grit size used shall be as recommended by the epoxy manufacturer.

3.02 APPLICATION

Application of the epoxy coating shall be in accordance with the manufacturer's instructions.

3.03 THICKNESS OF COATING

The minimum dry coating thickness shall be 8 mils, provided, however, that the thickness of coating in the grooves for valves or fittings designed to receive a rubber gasket shall be approximately 5 mils.

3.04 INSPECTION

Coating thickness shall be checked with a nondestructive magnetic type thickness gage. Coating integrity shall be tested with a spark testing unit operating at approximately 2,000 volts. All pinholes shall be marked, repaired, and retested. No pinholes or other irregularities will be permitted in the final coating.

3.05 FIELD REPAIRS

If small local repairs are necessary, they shall be made using Keysite 740, or approved equal. The surface must first be solvent-cleaned in accordance with SSPC-SP-1 (Solvent Cleaning).

END OF SECTION 09940

Revised 05/11/01

SPECIFICATIONS - DETAILED PROVISIONS
Section 15057 - Ductile Iron Water Pipe and Fittings

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**SECTION 15057
DUCTILE IRON WATER PIPE AND FITTINGS**

PART 1 - GENERAL

1.01 REQUIREMENT

It is required that the contractor shall furnish, unload and string along the trench site, all pipe and material as hereinafter described in these specifications. All fabrication, workmanship, material, and testing of pipe shall conform to the latest revision of the specifications.

1.02 DELIVERY

- A. Transport, deliver, unload, store and handle all materials in a manner to prevent damage to the materials or the work.
- B. All damaged, broken or otherwise defective materials will be rejected.
- C. Store all circular rubber gaskets and special lubricants in packaged materials with the manufacturer's name, brand and all other applicable data plainly marked thereon.

1.03 QUALITY ASSURANCE

- A. American Water Works Association (AWWA).
 - 1. Ductile iron pipe centrifugally cast in metal molds or sand-lined molds for water or other liquids ANSI A21.51 (AWWA C151).
 - 2. Cement mortar lining for ductile iron and gray iron pipe and fittings for water ANSI A21.4 (AWWA C104).
 - 3. Rubber gasket joints for ductile iron and gray iron pressure pipe and fittings (ANSI A21.11 (AWWA C111)).
 - 4. Standard for disinfecting water mains ANSI/AWWA C601.
 - 5. Installation of gray and ductile cast iron water mains and appurtenances ANSI/AWWA C600.
 - 6. Thickness design of ductile iron pipe ANSI A21.50 (AWWA C150).

1.04 MEASUREMENT AND PAYMENT

Payment for pipe shall be made on a unit price basis per lineal foot of pipe.

PART 2 - PRODUCT

2.01 TYPE OF PIPE

Ductile iron pipe shall conform to ANSI A21.51 (AWWA C151) class to thickness designed per ANSI 21.50 (AWWA C150), Tar (Seal) coated and cement mortar lined per ANSI A21.4 (AWWA C104) unless otherwise specified, with bolted mechanical joints or push-on joints as indicated on the plans or special provisions. Delivered pipe to include 5% +/- short joints.

2.02 CLASS OF PIPE

Ductile iron pipe shall be Class 50 unless otherwise noted.

2.03 TYPE OF FITTINGS

Fittings shall be gray or ductile iron and shall conform to ANSI A21.10 (AWWA C110) or A21.53 (AWWA C153), and ANSI A21.11 (AWWA C111). Fittings shall be bolted mechanical joints or push-on joints unless otherwise indicated on the plans, bid items, or the special provisions. Fittings shall be tar (seal) coated and cement mortar lined per ANSI A21.4 (AWWA C104). Above grade fittings shall be flanged and from the list of approved manufacturers.

2.04 SERVICE CONNECTION OUTLETS

Service connection outlets shall be bronze service saddles with CS threads for receiving a bronze corporation stop in accordance with EMWD Standard Drawing B-590, Type B. Service Saddle shall be Mueller, Jones or approved equal, for piping up to 16". Piping 16" and larger shall not be tapped for domestic services.

2.05 POLYETHYLENE ENCASEMENT

All ductile or gray iron pipe and fittings shall be polyethylene encased at the time of installation. Polyethylene encasement and installation shall be in accordance with ANSI/AWWA C105.

2.06 RESTRAINED SYSTEM

Approval by the pipe manufacturer of the restrained system that the contractor intends to use must be included as part of the material submittal to the Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION

Ductile iron pipe shall be installed in accordance with ANSI/AWWA C600 and Section 02718 of EMWD Specifications.

END OF SECTION 15057

Revised 05/90

SPECIFICATIONS - DETAILED PROVISIONS
Section 15058 - Cast Iron Fittings

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**SECTION 15058
CAST IRON FITTINGS**

PART 1 - REQUIREMENT

1.01 CAST IRON FITTINGS

- A. Cast iron flanged fittings shall conform to the latest revision of ASA Spec. A-21.10 (AWWA C-110) flanged fittings. These fittings shall be cement lined in accordance with the latest revision of ASA Spec. A21.4 and shall have standard machine finish.

- B. Cast iron hub fittings shall conform to the latest revision of AWWA C100-52 ASA 21-10-250 p.s.i. for Class 150 and 200 pipe, designed for use with pressure pipe except as otherwise specifically stated elsewhere. These fittings shall be cement lined in accordance with the latest revision of ASA Spec. A21.4.

Size, joint type, and pressure rating (150 or 250 p.s.i.) shall be as specified on purchase order or shown on construction plans and bid sheet.

END OF SECTION 15058

Revised 08/85

SPECIFICATIONS - DETAILED PROVISIONS
Section 15059 - Welded Steel Fittings

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**SECTION 15059
WELDED STEEL FITTINGS**

PART 1 - REQUIREMENT

1.01 FITTINGS

Fittings shall be fabricated as shown on the contract drawings, and/or as specified in the Special Conditions.

1.02 FLANGES

- A. Steel flanges shall conform to the requirements of Drawing B-288 made a part hereof by reference.
- B. Ring flanges shall be for welding to the pipe unless otherwise noted on the plans.
- C. Screwed flanges, where required, shall be Crane No. 556 or approved equal.

END OF SECTION 15059

Revised 110706

SPECIFICATIONS - DETAILED PROVISIONS
Section 15061 - Steel Cylinder Water Pipe

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**SECTION 15061
STEEL CYLINDER WATER PIPE**

PART 1 - GENERAL

1.01 DESCRIPTION

Contractor to furnish steel pipe as hereinafter described.

- A. Types of Steel Pipe
1. Cement mortar lined and cement mortar coated steel pipe (CML&C). This type of pipe is to be used in steel pipeline construction unless otherwise specified.
 2. Pre-tensioned concrete cylinder pipe.
 3. Cement mortar lined and coal-tar enamel coated and wrapped steel pipe.
 4. Cement mortar lined and asphalt coated and wrapped steel pipe.
- B. Pipe Class or Working Pressure shall be 150 psi unless otherwise specified. This specification includes all classes and specific tables for Class 100, 150, and 200 psi.
- C. Nominal Pipe Diameter shall mean the approximate inside diameter of the cement mortar lining.
- D. Fabricated Steel Plate Specials, defined as bends, wyes, reducers, outlets, and other pipe structures.

1.02 QUALITY ASSURANCE

Includes the requirements of this specification and the requirements of the latest revision of the following standards as applicable. Unless specifically stated otherwise, the most stringent requirement will govern when there is a conflict.

- A. AWWA C-200. American Water Works Association (AWWA) C-200 standard for steel water pipe 6 inches and larger.
- B. AWWA C-203. AWWA C-203 coal-tar protective coatings for hot applied enamel and tape.
- C. AWWA C-205. AWWA C-205 cement mortar lining and coating. Section 5.5.4 wire mesh: When wire mesh is used as the reinforcement for the coating, it shall have a minimum of 1/2" coating over the wire mesh.

Steel Cylinder Water Pipe
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- D. AWWA C-208. Standard dimensions for steel water pipe fittings.
- E. AWWA C-303. Reinforced concrete pressure pipe – steel cylinder type, pre-tensioned.
- F. ASTM C-150. Portland Cement.
 - 1. Type II Cement.
 - 2. Type V Cement.
- G. ASTM A-234. Piping fittings of wrought carbon steel and alloy steel for moderate and elevated temperatures.
- H. ASTM-A-615-GR40. Deformed and plain billet-steel bars for concrete reinforcement.
- I. AWWA Manual M-11. Design and installation of steel pipe.
- J. Standard Drawing B-288. EMWD standard drawing for steel plate flanges.
- K. ASTM D-2240. Rubber property - durometer hardness.

1.03 SUBMITTALS

- A. Pipe Layout Drawings. Pipe (36 inches and larger) shall be fabricated to adhere to the contract construction drawings. The Contractor shall submit pipe layout drawings for approval by the Engineer when the pipe layout varies from the alignment or grade shown on the contract drawings. These drawings shall be the same scale as the contract drawings. The District will allow the manufacturer to utilize a set of reproducible contract drawings to reflect the proposed deviations from the planned grades. Departures from line and grade within the following parameters will be permitted in the manufacture of the pipe to allow the use of joint pulls to effect changes of alignment:
 - 1. Horizontal alignment shall be within 4 inches of the alignment shown on the contract drawings.
 - 2. In vertical alignment, depth may be reduced 1 inch or increased 4 inches if the following minimum vertical clearances between outside diameters of other facilities are maintained and no additional highpoints are created :
 - a) 1 foot vertical clearance between sewer and water pipelines.
 - b) 0.5 foot vertical clearance between all other facilities except when specifically shown otherwise on the contract drawings.

3. Horizontal location of the vertical P.I. may deviate by 0.5 feet.

(Pipe smaller than 36 inch may be straight run pipe with horizontal and vertical bends fabricated to conform to construction drawings and welded to straight run pipe with butt straps per Standard Drawing B-304 or other approved full welded joint connections.)

Proposed departures in excess of these limits must be approved by the Engineer prior to initiation of layout drawings.

Computer printouts will be accepted in lieu of layout drawings except for such proposed departures.

- B. Fabricated Steel Plate Specials. Fabricated steel plate specials submittals shall be approved prior to fabrication. The dimensions shall conform to AWWA C-208 except as modified herein or as otherwise shown on the plans.

1. Pipe Outlets. The measurement from the outside of pipe to the face of flange shall be 12" unless otherwise shown. Outlets shall be designed per AWWA Manual M-11, and design of stiffner plates shall follow the nomograph method.

Pipe outlets shall also be provided for chlorination corp stops, air valve assemblies, services, and other appurtenances required by the contract drawings. Brass plugs shall be provided for installation upon later removal of the chlorination corp stops.

2. Bends

- a) The radius of bends shall be a minimum of $2\frac{1}{2}$ times the pipe diameter unless specified otherwise.
- b) Bends may be welded to adjacent pipe sections.
- c) Bends shall conform to the following table:

2-piece	0° - 30°
3-piece	30° - 45°
4-piece	45° - 67½°
5-piece	67½° - 90°

- C. Rubber Gaskets. Test results showing the properties of the material used in the rubber gaskets shall be submitted by the Contractor if requested by the Engineer.

Steel Cylinder Water Pipe
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- D. Pipe Design. Pre-tensioned concrete cylinder pipe reinforcing steel shall be computed as follows:

$$A_s = \frac{6 P_w D_y}{f_s}$$

Where:

A_s = Total cross-sectional area of circumferential steel (cylinder plus bar reinforcement) --- sq. in./ft. of pipe

P_w = Pressure Rating (Class) --- psi

D_y = Inside diameter of steel cylinder – inches

f_s = Average circumferential stress in psi in the steel cylinder and bar reinforcement when the section is subjected to working pressure

and

f_s = is not to exceed 16500 psi nor 50% of the specified minimum yield strength of the steel used in the cylinder. Bar reinforcement shall not be greater than 60% of the total area of circumferential reinforcement.

1.04 DELIVERY

Pipe and material shall be furnished, delivered and strung along the trench site.

- A. Internal bracing adequate for handling and transportation shall be installed as soon as practical after the application of cement mortar lining. All bracing shall remain in the pipe until installation and backfilling are completed.
- B. Gasket material shall be furnished with the pipe for storage in a cool, well ventilated place and protected from direct sunlight.

1.05 JOB CONDITIONS

Pipe and materials shall not be fabricated, stored, or installed in climatic conditions that will adversely affect the quality of the finished pipeline project.

1.06 ALTERNATIVES

Pipe for projects that are federally funded, in part or whole, shall also meet or exceed federal requirements:

- A. Steel pipe shall conform to federal specification SS-P-385A for cement mortar lined and reinforced cement mortar coated pipe.

- B. Pre-tensioned concrete cylinder pipe shall conform to federal specification SS-P-381B.

PART 2 - PRODUCTS

2.01 MATERIALS

For all steel manufactures outside the United States, the Contractor shall submit to the District, for its approval, a certified letter stating that the steel meets or exceeds the following: all of the requirements of AWWA C-200, the applicable ASTM Standards, and this Specification, and provide certified physical and chemical test results. The manufacturer of the steel cylinder shall be responsible for all requirements of these specifications. Manufacturers must be per EMWD's "approved materials list" and are: Ameron, Continental Pipe Manufacturing Co., Mid America Pipe, Northwest Pipe Company and Rosco Moss.

A. Cement Mortar Lined Steel Pipe Cylinder

1. Steel thickness shall be at least 12 ga. (0.1046").
2. Steel thickness shall be determined from the pressures imposed (Class) and the design stress of the steel. Design stress is defined as one-half () of the allowable minimum yield stress of the steel.
3. Steel pipe shall conform to the following table which includes minimum diameters and minimum thicknesses for various classes and nominal diameters. Note: Plate thickness is based on steel with a yield stress of 33,000 psi and a design stress equal to 50% of the yield stress (16,500 psi).

Nominal Pipe Diameter	Minimum Cylinder Diameter	Class 200 Min. Cylinder Plate Thickness	Class 150 Min. Cylinder Plate Thickness	Class 100 Min. Cylinder Plate Thickness
4"	4-1/2"O.D.	0.1046"	0.1046"	0.1046"
6"	6-5/8"O.D.	0.1046"	0.1046"	0.1046"
8"	8-5/8"O.D.	0.1046"	0.1046"	0.1046"
12"	12-3/4"O.D.	0.1046"	0.1046"	0.1046"
14"	15-1/4"O.D.	0.1046"	0.1046"	0.1046"
16"	17-3/8"O.D.	0.1046"	0.1046"	0.1046"
18"	19-3/8"O.D.	0.1160"	0.1046"	0.1046"
20"	21-3/8"O.D.	0.1280"	0.1046"	0.1046"
21"	22-3/8"O.D.	0.1340"	0.1046"	0.1046"
24"	25-3/8"O.D.	0.1519"	0.1143"	0.1046"
27"	28-3/8"O.D.	0.1699"	0.1278"	0.1046"
30"	31-3/8"O.D.	0.1879"	0.1413"	0.1046"
33"	34-3/8"O.D.	0.2058"	0.1548"	0.1046"
36"	37-3/8"O.D.	0.2238"	0.1684"	0.1126"
39"	40-3/8"O.D.	0.2418"	0.1819"	0.1216"
42"	43-3/8"O.D.	0.2597"	0.1954"	0.1306"

Steel Cylinder Water Pipe
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Nominal Pipe Diameter	Minimum Cylinder Diameter	Class 200 Min. Cylinder Plate Thickness	Class 150 Min. Cylinder Plate Thickness	Class 100 Min. Cylinder Plate Thickness
45"	46-7/8"O.D.	0.2807"	0.2111"	0.1412"
48"	49-7/8"O.D.	0.2987"	0.2247"	0.1502"
54"	55-7/8"O.D.	0.3346"	0.2517"	0.1683"

4. Cylinder shall conform to AWWA C-200.
5. Cement mortar lining shall conform to AWWA C-205.
6. Separate joint rings, if used, shall conform to Section 2.6, AWWA C-303.

B. Pre-tensioned Concrete Cylinder Pipe

1. Shall conform to the following table:

**PRE-TENSIONED CONCRETE CYLINDER PIPE
WORKING PRESSURE**

Nominal Pipe Diameter	Cylinder Diameter	Class 200		Class 150		Class 100	
		Plate Thickness	Total Area (sq."/ft)	Plate Thickness	Total Area (sq."/ft)	Plate Thickness	Total Area (sq."/ft)
12"	12-3/4"O.D.	12ga.	1.485	12ga.	1.485	12ga.	1.485
14"	15-1/4"O.D.	12ga.	1.485	12ga.	1.485	12ga.	1.485
16"	17-3/8"O.D.	12ga.	1.485	12ga.	1.485	12ga.	1.485
18"	19-25/32"O.D.	12ga.	1.485	12ga.	1.485	12ga.	1.485
20"	21-25/32"O.D.	12ga.	1.584	12ga.	1.485	12ga.	1.485
21"	22-25/32"O.D.	12ga.	1.657	12ga.	1.485	12ga.	1.485
24"	25-3/4"O.D.	12ga.	1.873	12ga.	1.495	12ga.	1.495
27"	28-25/32"O.D.	12ga.	2.093	12ga.	1.570	12ga.	1.525
30"	31-7/8"O.D.	12ga.	2.318	12ga.	1.737	12ga.	1.555
33"	34-7/8"O.D.	12ga.	2.536	12ga.	1.902	12ga.	1.585
36"	37-7/8"O.D.	12ga.	2.755	12ga.	2.066	12ga.	1.615
39"	40-7/8"O.D.	12ga.	2.973	12ga.	2.230	12ga.	1.645
42"	43-7/8"O.D.	11ga.	3.191	12ga.	2.393	12ga.	1.675
45"	46-7/8"O.D.	11ga.	3.409	12ga.	2.557	12ga.	1.704
48"	49-7/8"O.D.	10ga.	3.628	11ga.	2.720	11ga.	1.915
54"	55-7/8"O.D.	9ga.	4.063	11ga.	3.048	11ga.	2.032

- 12 ga. = .1046 = 1.255 square inch/ft.
 11 ga. = .1196 = 1.435 square inch/ft.
 10 ga. = .1345 = 1.614 square inch/ft.
 9 ga. = .1495 = 1.794 square inch/ft.

2. Rod reinforcing shall conform to ASTM A615 GR40, and the minimum diameter shall be 7/32".
3. Shall conform to AWWA C-303.

C. Coatings

1. Pre-tensioned concrete cylinder pipe shall be coated per AWWA C-303 except the cement shall be Type II or Type V.
2. Cement mortar lined steel pipe shall be cement mortar coated unless specified otherwise.
 - a) Cement Mortar Coating
 - (i) Shall be a minimum of 3/4" thick.
 - (ii) Shall either be Type II or Type V cement, unless specifically stated on the plans or in the Special Conditions.
 - (iii) Shall be one type of cement; i.e., Type II & V shall not be mixed together.
 - (iv) Shall meet or exceed AWWA C-205 requirements.
 - (v) Shall be of adequate thickness to provide required rigidity and corrosion protection.
 - b) Coal-Tar Enamel Coated and Wrapped Coating shall conform to AWWA C-203
 - (i) Type B primer shall be used.
 - (ii) Coal-tar enamel may be Type I or Type II.
 - (iii) Wrapping shall be a single layer of glass mat or 15-pound coal tar saturated asbestos felt.
 - (iv) The coating shall be whitewash.
 - c) Asphalt Coated and Wrap Coating shall use
 - (i) Asphalt primer.
 - (ii) Asphalt (hot applied).
 - (iii) Mica surfaced 15-pound pipeline felt.
 - d) Field painting shall be used on above-ground installation as shown on the drawings
 - e) Bare metal shall be coated with a suitable primer for its intended use

Steel Cylinder Water Pipe
Section 15061 – 8

D. Steel Plate Specials

1. Shall be constructed of steel plate, thickness computed from the greater of the following criteria, unless a still greater requirement is shown on the drawings or stated in the special conditions:

- a) Thickness not less than 3/16"; or
- b) Thickness as determined from the formula

$$T \geq \frac{D \times P}{2 \times 12,500}$$

Where:

T = wall thickness in inches

D = inside diameter of steel cylinder in inches

P = design pressure (class) in pounds per square inch

2. Schedule 30 or heavier steel pipe in standard diameters may be used in lieu of above paragraph "2.01, D1" for outlets that are 12" and smaller diameter (12.75", 10.75", 8.625", 6.625" and 4.5" outside diameters).
3. Steel welding fittings conforming to the requirements of ASTM Designation A-234 may be used when available in suitable sizes.
4. Cement mortar lining meeting AWWA C-205 except handwork reinforcement shall be 2"x 4" No. 12 welded wire fabric.
5. Coating meeting the requirements of straight pipe.
6. Stiffner plates, when required, designed per the nomograph method of AWWA Manual M-11.
7. Reinforced steel collar pads designed for the specified pressure where needed.
8. Materials meeting or exceeding AWWA C-200 requirements.

E. Rubber Ring Gaskets

1. Shore durometer hardness range shall be in the range of 50-55 in accordance with ASTM D-2240.
2. Compound shall conform to the requirements of Section 2.8 AWWA C-303.

2.02 MIXES

All mixes shall conform to the applicable reference sections.

2.03 FABRICATION OF PIPE

- A. Steel cylinder pipe shall be fabricated in accordance with:
1. AWWA C-200 for cement mortar lined steel pipe.
 2. AWWA C-303 for pre-tensioned steel cylinder steel pipe.
- B. Cement mortar lining process shall be followed with sealing each pipe end with a waterproof cover prior to carefully moving the pipe section. The pipe sections shall be cured under sprinklers or by other processes approved by the Engineer.
- C. Coatings shall be applied after the exterior of the pipe is thoroughly cleaned and free from all loose mill scale and rust.
1. Cement mortar coating shall be applied pneumatically or by impaction resulting in a dense uniform coating that adheres tightly to the pipe.
 2. Coal-tar enamel and wrapped coating shall be applied in accordance with AWWA C-203.
 3. Asphalt coating and wrapping.
 - a) Shall be applied after pipe is fabricated and hydrostatically tested.
 - b) Asphalt primer.
 - (i) Shall be applied to clean-dry surfaces to produce a suitable bond between the metal and subsequent coating of asphalt.
 - (ii) Shall be uniform and free from bare spots.
 - (iii) Shall be protected from rain and fog during and between applications.
 - c) Hot asphalt shall be applied after the primer has completely hardened and with, or immediately preceding, the wrapping material in sufficient quantity to form a bead on the exposed edge of wrap.
 - d) Wrapping material shall be spirally wrapped under tension to ensure complete coverage, 3/4" lap at edge, no wrinkles and buckles, and complete cementing to the pipe with hot asphalt.

Steel Cylinder Water Pipe
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- e) Coating and wrapping shall be omitted at each end for a sufficient distance to permit the making of field joints. All exposed bare metal shall be coated with a suitable primer.

D. Joints

1. All pipes shall have rubber gasket joints unless otherwise shown.
 - a) The steel area in the bell shall not be less than the area in an equivalent length of pipe barrel.
 - b) Rubber gasket ends formed integrally with the steel cylinder shall be formed either by sizing with a machined swage or die, or by rolling per AWWA C-200.
 - c) Separate rubber gasket joint rings shall be formed per requirements of Section 3.3 of AWWA C-303.
2. Ends that are not rubber gasket, including but not limited to weld bells, plain ends, grooved ends, and butt straps shall conform to AWWA C-200 where applicable, and to the construction drawings.
3. Flanges shall conform to Eastern Municipal Water District standard drawing B-288.

E. Steel Plate Specials shall conform to approved shop drawings and shall be fabricated in a shop approved for that purpose by the Engineer.

1. Each special shall have a mark on the top and bottom corresponding to the true vertical axis.
2. Outlets, including wyes, shall be built into the wall of the pipe.
3. Fabricated steel fittings of suitable design shall be welded to the cylinder before the exterior coating is placed around the fittings.
4. Cement mortar lining shall meet the requirements of straight pipe with the provisions that handwork lining reinforcement shall be positioned approximately in the center of the lining. The wires spaced 2" on center shall extend circumferentially around the pipe. The fabric shall be securely fastened to the pipe. Splices shall be lapped 4" and the free ends tied or looped to ensure continuity.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Notification of Manufacture. Unless specifically waived, EMWD Inspection Department shall be notified at least 48 hours prior to commencement of the manufacture of pipe.
- B. Hydrostatic Testing. Steel cylinders shall be hydrostatically tested to a stress equal to 75% of the minimum yield point of the steel. Certification of all cylinders is required by the District.
- C. Specials. Specials shall be bulkheaded and tested prior to lining and coating of weld seams at one-and-one-half ($1\frac{1}{2}$) times the design pressure (class). Dye penetrant process may be used on all untested welds in lieu of hydrostatic testing if the straight pipe used in fabricating the special has passed a hydrostatic test of 75% of the yield point. All defective welds including pinholes and porous welds shall be chipped out, rewelded, and retested.
- D. Soap and Compressed Air Test
 - 1. All double-welded lap joints, butt-strap joints, and other joints susceptible to this test shall be tested by the soap and compressed air method as hereinafter described. After completion of the shop hydrostatic test of the pipe sections the soap and compressed air test also may be used instead of hydrostatic testing of welded joints in the steel manhole outlets, which are attached to steel-plate sections.
 - 2. As soon as practicable after the welding of each joint to be tested by the soap and compressed air test has been completed, the Contractor shall subject each joint to a soap test by forcing compressed air, at approximately 40 pounds pressure per square inch, into each said joint and, while the joint is under pressure, every portion of every welded seam forming a part of the joint shall be swabbed with a heavy soap solution or an approved, commercial, bubble producing leak test fluid and shall be carefully examined for leakage. The Contractor shall repair any defects disclosed by the test by chipping out and rewelding the chipped section, after which the same test shall again be applied. The Contractor shall provide all apparatus and materials for making the tests, shall drill and tap the necessary holes and shall plug weld the holes after testing.
- E. Rubber Gaskets. Rubber gaskets shall be subject to inspection and/or testing by the Engineer. All unsatisfactory gaskets shall be immediately replaced at no expense to the District.
- F. Manways. All 30" diameter and larger pipe shall have 24" diameter or larger access manways within 750 feet of any interior point of the pipeline.

Steel Cylinder Water Pipe
Section 15061 – 12

1. Manways shall consist of 24" diameter outlets with 24" blind flanges.
2. Manways shall have a maximum spacing of 1500 feet on center. At valve installations, manways shall be located on both sides of each valve a maximum of 35 feet.
3. Outlets or bumped heads that provide an equal or larger opening than a 24" manway may be used for pipe access.
4. Manway locations shall be selected to minimize impact to traffic, and shall be approved by EMWD prior to pipe fabrication.

3.02 INSTALLATION

- A. Preparation. Internal bracing, in addition to the bracing used for handling and transportation of the pipe, shall be installed when required to ensure maximum permissible deflections are not exceeded during laying, backfill, and compaction.
- B. Pipe Zone Density. Relative compaction in pipe zone III as shown on standard drawing B-286B shall be in accord with the manufacturer's recommendation. All pipe bid for this project shall meet EMWD's minimum standards as set forth in Section 15061 herein. The Contractor, in conjunction with the pipe manufacturer, will indicate in the space provided and attached hereto as part of the bid forms, the pipe zone compaction to be constructed, the mortar thickness - both lining and coating - and the trench slope construction.
- C. Diapers shall be impervious if available.
 1. Width of diapers, where used, shall be sufficient to allow cupping of the diaper for increased thickness of the joint mortar. Recommended minimum diaper widths:
 - a) 20" dia. pipe and larger: 12"
 - b) 12" - 18" dia. pipe: 10"
 - c) 10" dia. pipe and smaller: 9"
 2. Mortar placement shall be from one side of the diaper, to allow the mortar to flow around the bottom and up the opposite side of the pipe, to preclude the possibility of any voids inside the diaper.
- D. Curing operations shall begin immediately after completion of joint mortaring.

1. Immediate backfill should follow the completion of the joint mortaring operation where possible. Care must be taken to immediately wet down and consolidate the backfill, to avoid draining the moisture from the mortar through porous diaphragms into dry backfill soil, or disturbing the mortar set by subsequent compaction of the backfill.
2. Completed-joint mortar to be exposed to the sunlight where backfill will not take place until after the mortar has hardened must be kept continually moist during the curing period to prevent cracking of the curing mortar.

END OF SECTION 15061

Revised 05/23/02

SPECIFICATIONS - DETAILED PROVISIONS
Section 15064 - Plastic (PVC) Pressure Water Pipe & Fittings

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SECTION 15064
PLASTIC (PVC) PRESSURE WATER PIPE & FITTINGS

PART 1 - GENERAL

1.01 REQUIREMENT

It is required that the Contractor shall furnish, deliver, unload and string along the trench site, all pipe and material as hereinafter described in the specifications. All fabrication, workmanship, material and testing of pipe shall conform to the latest revision of the specifications.

1.02 DELIVERY

- A. Transport, deliver, unload, store and handle all materials in a manner to prevent damage to the materials or the work.
- B. All damaged, broken or otherwise defective materials will be rejected.
- C. Store all circular rubber gaskets and special lubricants in packaged materials with the manufacturer's name, brand and all other applicable data plainly marked thereon.

1.03 QUALITY ASSURANCE

Unless otherwise specified, all work specified herein and as shown on the drawings shall conform to the applicable requirements of the latest revision of the following standards. Unless specifically stated otherwise, the most stringent requirement will govern when there is a conflict.

- A. AWWA C-900. American Water Works Association (AWWA) C-900 standard for polyvinyl chloride (PVC) pressure pipe 4 inches through 12 inches for water.
- B. AWWA C-905. American Water Works Association (AWWA) C-905 standard for polyvinyl chloride (PVC) transmission pipe 14 inches through 36 inches.
- C. Any pipe showing discoloration, chaulking, checking or other visible damage due to ultraviolet light exposure shall not be accepted by the District.

1.04 MEASUREMENT AND PAYMENT

Payment for pipe shall be made on a unit price basis per lineal foot of pipe.

PART 2 - PRODUCTS AND MATERIALS

2.01 TYPE OF PVC PIPE

PVC pipe shall be extruded from 12454 A or B compound providing a hydrostatic design basis (HDB) of 4000 p.s.i. in accordance to AWWA C-900 and C-905. Pipe shall have cast iron outside diameters.

All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (elastomeric gaskets) shall be manufactured to conform with the requirements of ASTM F-477.

2.02 PIPE CLASS OR WORKING PRESSURE

AWWA C-900 PVC pipe shall be class 150 and AWWA C-905 PVC pipe shall be rated at 235 p.s.i. (DR-18) or as specified on approved drawings. PVC pipe shall not be installed for working pressures exceeding 150 p.s.i. unless specifically approved by the District.

2.03 TYPE OF FITTING

Fittings for PVC pipe shall be flanged or bolted mechanical joint or push-on joint ductile or gray iron fittings and shall conform to ANSI/AWWA C110/A21.10 or C153/A21.53, and ANSI/AWWA C111/A21.11. All fittings shall be cement mortar lined and tar (seal) coated in accordance with ANSI/AWWA C104/A21.4.

2.04 RESTRAINED SYSTEM

Restrained Joints shall be provided by a clamping ring and an additional ring designed to seat on the bell end of the pipe. The rings shall be connected with T-Head bolts or rods. Restraining devices shall provide full (360° degree) support around the circumference of the pipe. No point loading shall be permitted. Restraint of mechanical joint fittings shall be provided by a clamping ring installed on the PVC pipe and connected to the mechanical joint fitting with T-Head bolts or rods. Restraining devices shall meet or exceed the requirements of ASTM F-1674 or UNI-Bell B-13 "Recommended Standard Performance Specification for Joint Restrainers for Use with PVC Pipe." Restraining devices shall be UNI-Flange Series 1300 or 1350 or approved equal.

All buried steel parts shall be sand blasted in accordance with the coating manufacturer's technical data sheet for "submerged" service and coated with a two coat epoxy. Epoxy shall be Tnemac Series 66 or equal. All bolts and tie rod materials shall be either high strength cast iron containing a minimum of 0.5% copper or high-strength, low alloy steel, as specified in AWWA C-111 for buried mechanical joints.

2.05 SERVICE CONNECTION OUTLETS

All service connections to PVC pressure pipe water main shall be constructed with bronze service saddles with CS threads for receiving a bronze corporation stop in accordance with standard drawings. Service saddle shall be Jones, Mueller, or approved equal.

2.06 POLYETHYLENE ENCASEMENT

All ductile or gray iron fittings shall be polyethylene encased at the time of installation. Polyethylene encasement and installation shall be in accordance with ANSI/AWWA C105.

PART 3 - EXECUTION

3.01 FACTORY TESTING

All pipe shall be tested in the United States in accordance with AWWA C900 and C-905 and certification of the testing shall be furnished to the engineer upon his request prior to delivery. The engineer may be present during physical testing of pipe.

3.02 INSTALLATION

PVC pipe shall be installed in accordance with Sections 02718 and 02201 of Eastern Municipal Water District Specifications.

END OF SECTION 15064

Revised 01/03/00

SPECIFICATIONS - DETAILED PROVISIONS
Section 15077 - Grooved Couplings

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**SECTION 15077
GROOVED COUPLINGS**

PART 1 - GENERAL

1.01 DESCRIPTION

Where specified, mechanical grooved couplings and fittings shall be cast of malleable iron conforming to ASTM A-47 or ductile-iron ASTM A-536. The coupling shall be of the grooved, mechanical type which engages grooved pipe ends. The coupling shall be cast in two or more parts per manufacturer's standard. Coupling gasket shall be of molded synthetic rubber EPDM Grade "E" conforming to ASTM D-2000 designation 2CA615A15B44F17Z. Bolts and nuts shall be heat treated carbon steel conforming to ASTM A-183, minimum tensile 110,000 psi and oval neck track head type. Fittings shall be of grooved-end design to accept grooved mechanical couplings with or without field preparation as applicable. Couplings for grooved steel pipe shall be "Victaulic" Style 77 or approved equal. Couplings for grooved ductile iron or cast iron pipe shall be "Victaulic" Style 31 or approved equal.

END OF SECTION 15077

Revised: 12/17/09

SPECIFICATIONS - DETAILED PROVISIONS
Section 15081 - Gaskets

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**SECTION 15081
GASKETS**

PART 1 - GENERAL

1.01 REQUIREMENT

Gaskets for steel and cast iron flanges shall be of dimensions conforming to the requirements of Standard Drawing B-288, and shall be standard full face for pipe 27" diameter and larger.

Gaskets shall be 1/16", non-asbestos model # Garlock 3000 or Tripac 5000.

1.02 FLANGE INSULATING GASKET KITS

A. Pipe flange insulating kit materials shall be of the type designated by the manufacturer as suitable for appropriate service at the operating temperatures and pressures specified on the Plans.

B. Flange insulating kits shall consist of a one piece full-face, insulating gasket, an insulating sleeve for each bolt, two insulating washers for each bolt, and a steel washer between each insulating washer and nut.

1. Insulating gasket shall be a full faced NEMA Grade G-10 Glass Epoxy Laminated Retainer with a precision tapered groove to accommodate the compression of a BUNA-N or VITON sealing element. Minimum total thickness shall not be less than 1/8-inch. Dielectric strength shall be not less than 550 volts per mil, and compressive strength of not less than 50,000 psi. Use PSI Linebacker or equal.

a. Optional Materials:

1. Neoprene faced phenolic gasket

2. Insulating sleeves shall be full length, one piece, insulating flange bolt sleeves for the appropriate bolt size. Insulating sleeves shall be NEMA G-10 Glass Epoxy Laminated tubing (Pyrox). Dielectric strength shall be not less than 400 volts per mil.

a. Optional Materials:

1. Phenolic tubing
2. Nomex tubing
3. Mylar tubing
4. Polyethylene tubing

3. Insulating washers shall be NEMA Grade G-10 Glass Epoxy Laminated Washers with a minimum thickness of 1/8-inch. Dielectric strength shall not be less than 550 volts per mil, and compressive strength of not less than 50,000 psi.

Gaskets

Section 15081 – 2

- a. Optional Materials:
 - 1. Phenolic Washers
 - 2. Nomex Washers

- 4. Provide cadmium plated steel flange bolt washers for placement over the insulating washers with a minimum thickness of 1/8 inch.

END OF SECTION 15081

Revised 101907

SPECIFICATIONS - DETAILED PROVISIONS
Section 15089 - Nuts & Bolts

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**SECTION 15089
NUTS & BOLTS**

PART 1 - GENERAL

1.01 REQUIREMENT

Bolts and nuts for flanged fittings shall be bare steel conforming to SAE J429 Grade 5 or ASTM A449 medium carbon steel quenched and tempered meeting the following requirements, and shall have hex heads and lite-pattern hex nuts.

¼" Through 1" diameter

85,000 p.s.i. proof strength
92,000 p.s.i. yield strength
120,000 p.s.i. tensile strength

Over 1" to 1½" diameter

74,000 p.s.i. proof strength
81,000 p.s.i. yield strength
105,000 p.s.i. tensile strength

1.02 USE OF ZINC CAPS FOR BURIED PIPE

Each bolted fitting including couplings, flange adapters, restrained joints, etc. that have manufactured bolts and nuts shall have a minimum of 2 zinc caps anodes as specified below.

Bolt sizes and number of zinc caps:

through 1" diameter - 2 zinc caps
over 1" diameter - 4 zinc caps

Weight of zinc caps:

Zinc caps to be 6 oz. weight.

Material reference:

Zinc caps shall be per ASTM B418-80 and Mil-A-18001J, and be manufactured by Mars, Reliance, or equal.

END OF SECTION

Revised 012006

SPECIFICATIONS - DETAILED PROVISIONS
Section 15102 - Resilient-Seated Gate Valves

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**SECTION 15102
RESILIENT-SEATED GATE VALVES**

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish, deliver, and unload within the time specified in the Special Conditions, the resilient-seated gate valves as hereinafter described.

1.02 QUALITY ASSURANCE

Quality Assurance includes the requirements of this specification and the requirements of the latest revision of the following standards, as applicable. Unless specifically stated otherwise, the most stringent requirement will govern when there is a conflict.

- A. AWWA C-509. American Water Works Association Standard for Resilient Seated Gate Valves, 3" through 30" NPS, for Water and Sewage Systems
- B. AWWA C-515. American Water Works Association Standard for Reduced-Wall, Resilient Seated Gate Valves, 3"-16" & 3"-36" NRS.
- C. AWWA C-550. American Water Works Association Standard for Protective Interior Coatings for Valves and Hydrants.

1.03 SUBMITTALS

The name of the manufacturer of the valves to be furnished by the bidder shall be stated on the bidding sheets. Proposed valves other than those listed on the EMWD approved Material List must be submitted for evaluation well in advance of the bid opening, for acceptance prior to the award of the contract. Generally, the specified 35-day period following issuance of the Notice-of-Acceptance-of-Proposal is not sufficient for approval of alternate valves.

1.04 PRODUCT DELIVERY

- A. Storage. Valves shall be stored in the closed position to protect seating surfaces.
- B. Handling. Valves shall be carefully lowered from the truck to the ground. Do not hook hoists or fasten chains around stem, gearing, motors, cylinders, or handwheels.

1.05 JOB CONDITIONS

Valves shall not be fabricated, stored, coated, or installed in climatic conditions that will adversely affect the quality of the finished project.

Resilient-Seated Gate Valves
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1.06 ALTERNATIVES

Valve ends shall be as specified on the bidding sheet, plans or specifications as applicable; these may be flanged both ends, hub-end both ends, or one flanged end and one hub-end, conforming to the following specifications:

- A. Flanged End. Flanged ends shall be designed for the water pressure as specified in AWWA C-509 and drilled to the American Standard for 125# Cast Iron Flanges, and flange face shall not be raised. Flange face shall have standard machine finish.
- B. Hub-End. Hub-ends shall be designed for the water pressure as specified in AWWA C-509 and shall be "Ring-tite", "Fluid-tite" or approved equal.

1.07 GUARANTEE

Contractor shall guarantee all materials and workmanship of items furnished under these specifications shall be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The Contractor shall, at his own expense, repair or replace all defective materials or workmanship supplied by him that are found to be deficient with respect to any provisions of this specification.

PART 2 - PRODUCT

2.01 MATERIALS

Resilient Seated Gate Valves shall include the following materials:

- A. Non-Rising Stems. Clockwise to close, counterclockwise to open. Valve stems shall be of bronze, having a minimum tensile strength of 55,000 psi and a yield point of not less than 40,000 psi, with an elongation of not less than 10% in 2". Heat treatment will be permitted to develop these requirements. All bronze shall contain not more than 7% zinc nor more than 2% aluminum.
- B. 2" Square Nut with arrow cast in metal to indicate opening direction, except where specified otherwise.
- C. Resilient Seats may be bonded or mechanically attached to either the gate or valve body.

2.02 COATINGS

- A. All valves shall have internal and external ferrous parts epoxy coated. Wetted surfaces shall have an 8 mil minimum (dry film) thickness, unless otherwise specified. The epoxy shall be approved for potable water, and shall conform to AWWA C-550.
- B. All coated surfaces shall be visually and electrically examined for defects. The coating shall be holiday free as determined by a low voltage wet sponge test per AWWA C-550.

2.03 FABRICATION AND MANUFACTURE

- A. Interchangeability. All like parts of all valves of the same model number and size shall be interchangeable.
- B. Waterway. With the valve open, there shall be a smooth and unobstructed waterway at least equal to the nominal valve diameter. There shall be no sediment pockets in the valve.
- C. Valve Actuator. Resilient Seated Gate Valves 16-inches through 36 inches shall have a gear reduction actuator that meets the following maximum values for torque and number of turns:

Valve Size	Maximum Input Torque (ft. lbs.)	Maximum Number of Turns to Open/Close
16"	65	200
18"	80	225
20"	125	250
24"	150	310
30"	350	380
36"	385	450

- D. Cast Marking. Valves shall have the manufacturer's name, the size of the valve, and the working pressure cast on the side of the valves.
- E. Stem Sealing. Stems shall be sealed by the use of multiple stem seal o-rings.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Hydrostatic Tests. All valves shall have hydrostatic shell test of 400 psi and a bubble tight shut-off test of 200 psi.
- B. Coating Tests. All coated surfaces shall be visually and electrically examined for defects. The coatings shall be holiday free with a low voltage wet sponge test per AWWA C-550.
- C. Operation Test. Each valve shall be operated through one complete cycle in the position for which it is designed, to ensure proper functioning of all parts.

Resilient-Seated Gate Valves
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- D. Additional Testing (RSGVs 16-inch and Larger). Resilient Seated Gate Valves 16-inch and larger shall be hydrostatically tested and performance tested per AWWA C509 and C515. This test shall be conducted within 100 miles of the District office and shall be performed in the presence of a District Inspector. No valve shall be installed until this testing has been completed and approved by the District. Each valve shall be tested as detailed in AWWA and District Standard Specifications and as specified below:
1. Visually inspect each valve for obvious damage, substandard construction and compliance with specifications.
 2. Each valve shall be operated through one complete cycle in the position for which it is designed, to ensure proper functioning of all parts.
 3. Each valve shall be hydrostatically tested at its rated pressure. The testing medium shall be water (no air shall be used as the test medium under any circumstance). Both sides of the valve are to be tested.
 4. The test duration on each side of the valve shall be 5 minutes. A passing test is one where there is no visible leakage and no decrease in the initial test pressure.
 5. A valve that fails the hydrostatic test shall be either repaired or replaced. Repaired/replaced valves shall be retested using the same procedure.
 6. Valves shall only be repaired by personnel authorized by the valve manufacturer. Unless specifically authorized by the valve manufacturer, supplier or contractor shall not be permitted to perform repairs.

3.02 PREPARATION

Valves shall be complete when shipped. They shall be drained and closed before shipment.

END OF SECTION 15102

Revised 09/16/99

SPECIFICATIONS - DETAILED PROVISIONS
Section 15340 - Manholes and Fittings

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**SECTION 15340
MANHOLES AND FITTINGS**

PART 1 - GENERAL

1.01 REQUIREMENT

Under this specification, the Contractor shall be required to furnish, deliver and unload within the time specified in the Contract Documents, the manholes and fittings as specified on the Bidding Sheets, shown on the Contract Drawings, and described in these specifications, except as otherwise approved in writing by the Engineer.

1.02 MEASUREMENT AND PAYMENT

Payment for quantities of manholes will be made at the unit prices as stated on the Bidding Sheets.

1.03 GUARANTEE

The Contractor shall guarantee all materials and workmanship of items furnished under these specifications to be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The Contractor shall, at his own expense, repair or replace all defective materials or workmanship supplied by him found to be deficient with respect to any provisions of this specification.

PART 2 - PRODUCTS

2.01 MANHOLES

All manhole rings, tops, and cones, as constructed in place, shall be designed for A.A.S.H.O. H-20 highway loading, and shall conform to District standard drawings and the requirements of ASTM C-478 and the following requirements.

2.02 RINGS

All manhole rings shall be centrifugally spun or compactly vibrated in forms.

2.03 TOPS

All manhole tops and cones shall be compactly vibrated in forms.

Manholes and Fittings
Section 15340 – 2

2.04 MANHOLE COVERS

All manhole covers and frames shall conform to District standard drawings and the requirements for Class 30 gray iron castings in ASTM Designation A-48, or Class 60 Ductile Iron castings in ASTM A-536. The castings shall be thoroughly cleaned and coated with commercial quality asphaltum paint. Frames and covers shall be matchmarked in pairs before delivery to the work site and must be machined matched between cover and frame to avoid rocking.

2.05 MANHOLE STEPS

Manhole steps shall conform to District Standard Drawings and shall be constructed of 1/2" plain steel bar encapsulated with copolymer polypropylene plastic as approved by EMWD. Alternate to be approved by EMWD for casting-in-place.

END OF SECTION 15340

APPENDIX A
EMWD APPROVED MATERIALS LIST

Latest Revision:
January 3, 2013

EASTERN MUNICIPAL WATER DISTRICT APPROVED MATERIALS LIST

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APPENDIX "A"

EASTERN MUNICIPAL WATER DISTRICT APPROVED MATERIALS LIST

If Contractor uses materials listed on this approved material list, no formal submittal will be required, except for pipe submittals. Contractor, however, must submit and identify that materials to be used on the project comply with the approved list.

1. AIR VALVES

Air Release and Vacuum Valve - EMWD Standard Drawing B-598 and B-367, Sizes 1" & 2"

- APCO VALVE COMPANY - Model 143C and 145C
- CRISPIN VALVE COMPANY - Model UL-10 and UL-20
- EMPIRE VALVE COMPANY - Model 940
- VALVMATIC VALVE COMPANY - Model 201-C and 202C
- CLA-VAL COMPANY - Model #361-CAV564B and #362-CAV332

Air Release and Vacuum Valve - EMWD Standard Drawing B-578, Sizes 4" & 6"

- APCO VALVE COMPANY - Model APCO 149-C & APCO 150-C
- CRISPIN VALVE COMPANY - Model UL-41 (4") and Model AL-61/PL-10 (6")
- CLA-VAL COMPANY - Model #364-CAV332 and #366-CAV732-3

Pump Air Valve

- ARMSTRONG MACHINE WORKS - Model 21

2. CAST IRON FITTINGS C-110

Cast Iron Flanged Fittings, Various Sizes -

- Shall conform to the latest revision of ASA Specification A21.10 (AWWA C110) Flanged Fittings. These fittings shall be cement lined in accordance with the latest revision of ASA Specification No. A21.4 and shall have standard machine finish.

Cast Iron Hub Fittings -

- Shall conform to the latest revision of AWWA C100.52 ASA 21-10250 PSI for Class 150 and 200 pipe, cement line in accordance with the latest revision of ASA Specification A21.4.
- Size, Joint size, and Pressure Rating shall be as specified on Purchase Orders, Construction plans, and Bid Sheets.

Cast Iron Fittings -

- Shall conform to latest revision of ASA Spec. A21.10 (AWWA C110) Flanged Fittings.

Fittings shall be cement lined, ASA Spec. A21.4, and shall have standard machine finish.

- SIGMA CORPORATION - Model Sigma/Nappco
- STAR PIPE PRODUCTS - Model Star Fittings
- TYLER PIPE - Model Tyler Fittings
- UNION FOUNDRY* - Model Union Fittings *(Domestic Fittings)
- SMITH COPPER - Model Flanged Fittings for 125# and 250#

APPENDIX "A"

3. DUCTILE IRON FITTINGS C-153

Fittings shall be Ductile Iron and conform to ANSI/AWWA C153/A21.53, ANSI/AWWA C111/A21.11 and ANSI/AWWA C110/A21.10.

Fittings shall be Mechanical Joints or Push-on Joints, Tar coated (Seal), and Cement-mortar lined per ANSI A21.4 (AWWA/C104).

- PACIFIC STATES
- SIP INDUSTRIES
- SIGMA CORPORATION
- STAR PIPE PRODUCTS
- TYLER PIPE COMPANY
- UNION FOUNDRY
- U.S. PIPE
- ONE BOLT INC. (ASTM/A536 Restraint Joint Fittings)
- PIPELINE COMPONENTS, INC. (M.J. Compact Fittings – All Sizes; M.J. Full Body Fittings – All Sizes and Push On Fittings – 4" – 8")

4. FIRE HYDRANTS

Super Hydrant (6" x 1-4 x 2-2 ½"), EMWD Standard Drawings B-516 & B-517.

- AVK – Series 24 – Model 90 (24-90)
- CLOW - Model: El Rancho 2060 Bronze and Model: 860
- JONES - Model: J-3765 Bronze
- LONG BEACH IRON - Model: LBIW 615
- LONG BEACH IRON - Model: Series 130 Bronze (New Pattern)

Standard Hydrant (6" x 1-4 x 1-2 ½"), EMWD Standard Drawings B-362 & B-356

- AVK - Series 24 – Model 70 (24-70)
- CLOW - Model: El Rancho 2050 Bronze and Model: Ranger 850, F850, F860 Cast Iron
- JONES - Model: J-3700 Bronze, Model: J4040, J4060 Cast Iron
- LONG BEACH IRON - Model: Series 125 Bronze - New Pattern and Model: 611 East Bay

Intermediate Hydrant (6" x 2-2 ½"), EMWD Standard Drawings B-360 & B-354.

- CLOW - Model: Clow Rich Ranger 945
- JONES - Model: J-3720
- LONG BEACH IRON - Model: 601-613 Rich East Bay

5. FRAMES AND COVERS

Manhole Covers & Frames - 24" & 36" - Standard Drawing SB-61

- ALHAMBRA FOUNDRY - Model: A-1251 & A-1254
- EVERETT ENTERPRISES - Model: GTS - Pont-A-Mousson
- FAMEX - B&W Precast Construction - Model: F-1251 & F-1254
- NEENAH FOUNDRY - Model: R-1593
- RIVERSIDE FOUNDRY - Model #1254 and #1251
- SOUTHBAY FOUNDRY - Model: SBF-1251 & SBF-1254. Model SBF-1348 with Pick Hole for EMWD Std. Dwg. SB #30.
- NORFOLK CASTING CORP. – Model #NC-254
- STAR PIPE PRODUCTS – Model #1254

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Manhole Covers & Frames - Locking

- ALHAMBRA FOUNDRY - Model: A-1175
- FAMEX FOUNDRY - Model: F-1251
- NEENAH FOUNDRY - Model: R-1251
- SOUTHBAY FOUNDRY - Model: SBF-1251
- LONG BEACH IRON WORKS - Model RE85R3PD GTS
- Manhole Shafts, Cones, Flat Tops & Grade Rings - 24" - 48"
- AMERICAN PIPE
- ASSOCIATED CONCRETE
- B&W PRECAST CONSTRUCTION
- INLAND CONCRETE
- HOWARD ENTERPRISES
- MAR-CON PRODUCTS
- SAN DIEGO PRECAST
- SOUTHWEST CONCRETE

6. METERS

a. Propeller

- McCROMETER - Model: MG-900 Series, MW-900 Series and MW-500 Series.
(ECR Register AMI/AMR, Flex Net compatible, acre feet register)
- SENSUS Tech. Inc. – Model 101 & 102
Agriculture (ECR Register AMI/AMR, Flex Net compatible, acre feet register)

b. Magnetic (Water & Sewer)

- ENDRESS & HAUSER – Model Promag 53 W - 1" - 78" (AMI/AMR Sensus Flex Net)
(acre feet register)
- ABB – Model WaterMaster-FE 121-Flowmeter system - 10" - 88" (AMI/AMR Sensus Flex Net)
(acre feet register)
- SIEMANS – Model Sitrans F M Mag 5100 W - 1" - 78" (AMI/AMR Sensus Flex Net)
(acre feet register)

c. Compound

- SENSUS Tech. Inc. – Model Omni C2 - 3" – 6" (AMI/AMR Sensus Flex Net)
(cubic feet registers)

d. Multi-jet

- SENSUS Tech. Inc. – Model Bronze Multi-Jet - 5/8" – 2" (AMI/AMR Sensus Flex Net)
(cubic feet register)

e. Turbine

- SENSUS Tech. Inc. Model Series "W" - 8" – 10" (AMI/AMR Sensus Flex Net)
(acre feet register) (strainer required)
- SENSUS Tech. Inc. - Model Omni T2 - 1.5" – 6" (AMI/AMR Sensus Flex Net)
Domestic Turbine Meters (cubic feet register)
Landscape Turbine Meters (2" & smaller shall have cubic feet registers, 3" & larger shall have acre feet register) (strainer required)

f. Electromagnetic (Domestic Water)

- SENSUS Tech. Inc. Model iPerl – 5/8" – 1" (AMI/AMR Sensus Flex Net) (cubic feet registers)

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7. METER BOXES

- a. Concrete or Polymer Concrete EMWD Standard Drawing B-590, B-591, B-342, B-344
- ARMORCAST PRODUCTS - 12" x 20", A6000485SA (No. 37) 5/8" Polymer Concrete
13" x 24", A6001946PC-12 (No. 38) 1" Polymer Concrete
 - BROOKS PRODUCTS - 17" x 30", Model No. 66 and 30" x 48", Model No. 68
 - EISEL ENTERPRISES (H&C) - 17" x 30", Model # 666B and 30" x 48", Model # 68MB
 - J&R CONCRETE - 12"x20", Model No. 4½ (No. 37) Polymer Concrete
13"x24", Model W5 ¼ "P" (No. 38) Polymer Concrete
17" x 30", Model No. 6B
30" x 48", Model No. 8
 - ASSOCIATED CONCRETE PRODUCTS -
12" x 20", Cat #WPB111812C21 (#437) Polymer Concrete and Cat #WPC1118RLC11
13" x 24", Cat #WPB132412A21 (#438) Polymer Concrete and Cat #WPC1324RLC11

b. Meter Boxes and Vaults - Cross Reference Chart

Valve Box Equals

<u>BROOKS PRODUCTS</u>	<u>EISEL ENTERPRISES</u>	<u>J&R CONCRETE PRODUCTS</u>
#1-RD	#1R-VB-CC	#1-R
#1-RT	#2VB-VC	#2-R
#3-RT	#10VB-VC	#3-R
#4-TT	#4TT VB-VC	#4-T
#1-SP	#1RVB-CC	#5-R

Utility Vault Equals

<u>SIZE</u>	<u>BROOKS</u>	<u>EISEL ENTERPRISES</u>	<u>J&R CONCRETE PRODUCTS</u>
4'x4'	#W-300 Series	#EM 4848	#4400-1W
4'x6'6"	#W-500 Series	#EM 4878	#4660-2W
4'6"x8'6"	#W-510 Series	#EM 60108	#4686-1W
4'x 7'9"	#W-600 Series	#EM 4896	#4700-1W
4'6"x10'6"	#W-610 Series	#EM 60132	#5106-1W
6'x8'	#W-680 Series	#EM 7296	n/a #5080W

c. Vaults

- BEST CONCRETE PRODUCTS - Model: MCT-4 and MCT-5
- ASSOCIATE CONCRETE - As approved by Engineering.
- ARMORCAST PRODUCTS - Polymer Concrete only.

c. Domestic Meter Box Lid Covers

- ARMORCAST PRODUCTS – Model # A6000484-H1
- JR CONCRETE – Model # PC 412 QRP

APPENDIX "A"

8. MISCELLANEOUS BRASS

a. Corp Stops

- FORD - F-1000 Series, F-600 Series, FB700 Series
- JONES - J-3401 Series, J-1500 Series, J-1505 Series, J-1929 Series, J-1930 Series, J-1935 Series
- McDONALD - 4701-T, 4701-22 and 4701
- MUELLER - H-15000 Series, H-15008 Series, H-15000(w/110), H-15013 (w/IPT), H-15023 (w/IPT) and H-15008

b. Curb Stops

- FORD - ZV-3W
- JONES - J-182
- MCDONALD - 10621S
- MUELLER - H-11026
- PUBCO - 2110

c. Elbows

d. Angle Stops

- FORD - KY43-444W, FV23-666W, FV23-777W, FV43-666W, FV43-777W
- JONES - J-4201, J-1973W, J-1975W
- MUELLER - H-14258, H-14277, Mueller (110)
- McDONALD - 4602-T and 4602-22

e. Brass Saddles

*Service Saddles for A.C. Pipe - 4" thru 12"

- JONES - Model: J-975, J-979

*Service Saddles for C-900 Pipe - 4" thru 12"

- JONES - Model: J-996R, J-996
- McDONALD - Model: 3805
- MUELLER - Model: H-13000
- ROMAC - Model: B-101, B-202
- FORD - Model S902 & S912 (Style B2 piece bolted design)
- CAMBRIDGE BRASS - #800 series hinged bronze saddle - 3/4" - 2"

*Service Saddles for Ductile Iron Pipe - 4" thru 36"

- FORD - Model: F-101, F-202
- ROMAC - Model: Romac 101, Romac 202
- SMITH-BLAIR - Model: Rockwell 311, Rockwell 313

*Tapping Saddles for A.C., C-900, and Ductile Iron Pipe. Size 4" - 24"

- FORD - Model: Fast-Sleeve 18-8 All Stainless Steel
- JCM IND. - Model: JCM-432 All Stainless Steel, JCM-452 All Stainless Steel 14" & above.
- POWERSEAL PRODUCTS - Model: 3490 All Stainless Steel
- ROMAC - Model: SST 18-8 All Stainless Steel
- SMITH BLAIR INC. - #663 (4" - 24") AND #665 (6" - 12")

*NOTE: Size 10" & above require double strap.

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9. PIPE

- a. Cement Mortar Lined & Coated Pipe
 - AMERON CONCRETE PIPE
 - CONTINENTAL PIPE
 - NORTHWEST PIPE & CASING
 - ROSCOE-MOSS
 - MID AMERICA PIPE

- b. Ductile Iron Pipe - EMWD Spec. 15057 - AWWA C-600, AWWA C-151, AWWA C-150, & AWWA C-104
 - PACIFIC STATES
 - U.S. PIPE

- c. High Density Polyethylene Pipe

J-M Manufacturing Company, Inc.
Chevron Phillips Chemical Company

- d. Polyvinyl Chloride Pipe C-900/C-905

4" - 12" - C-900, EMWD Spec. 02768 & 15064
14" - 36" - C-905, EMWD Spec. 15064

 - CARLON PIPE - Carlon
 - CERTAIN-TEED CORP.
 - JOHN-MANSVILLE COMPANY - JM
 - PW PIPE
 - VINYL-TECH - White Knight
 - DIAMOND PLASTICS CORP. - 4" - 24"

- e. PVC Pipe (Sewer) - Note: See 1.a (Fittings and pipe shall be from the same manufacturer when they make both. If only pipe is made, fittings from 1.a shall be used).
 - ARMCO PIPE - Contech
 - CARLON PIPE
 - CERTAIN-TEED CORP.
 - P.W. PIPE
 - JOHNS-MANSVILLE COMPANY
 - VINYL-TECH - White Knight
 - DIAMOND PLASTICS CORP. - SDR 35 PVC
 - SYRSCO INC - SDR 35 PVC
 - LAMSON VYLON - 21" thru 48"

- f. PVC Sewer Fittings (4" - 8"), gravity use only
 - GPK
 - MULTI-FITTINGS CORP.
 - JOHNS-MANSVILLE CO.

- g. Reinforced Concrete Pipe (Sewer)
 - AMERON
 - HYDRO CONDUIT
 - RIALTO PIPE

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- h. Vitrified Clay Pipe (Sewer) - Note: Fittings to be same as pipe.
 - BUILDING PRODUCTS CO. (MCP) - JCP Compression Joints
 - GLADDING McBEAN CO. - "Speed-Seal"
 - MISSION CLAY PRODUCTS - "Band Seal"
 - PACIFIC CLAY PRODUCTS - "Wedgelock"

- 10. **PRECAST MANHOLES - Manhole Shafts, Cones, Flat Tops & Grade Rings 24" - 48"**
 - AMERICAN PIPE
 - AMERICAN HIGHWAY PRODUCTS
 - ASSOCIATED CONCRETE
 - B&W PRECAST CONSTRUCTION
 - HOWARD ENTERPRISES
 - INLAND CONCRETE
 - MAR-CON PRODUCTS
 - SAN DIEGO PRECAST
 - SOUTHWEST CONCRETE

- 11. **RESTRAINING JOINT DEVICES**
 - EBBA IRON – 2000 PV Series - 4" - 24" (C-900 & C-905)
 - 1100 Series - 3" - 48"
 - 2100 Series - 4" - 12" (C-900)
 - 2800 Series – 14" – 36" (C-905)

 - NAPPCO/SIGMA CORP. - Model: PV-LOK Model PVM - 2" - 12"
PV-LOK Model PVP - 2" - 12"
ONE LOK - 4" - 36"

 - U.S. PIPE - Field Lok Gaskets - 4" - 12"

 - FORD - Uni-flange Series No. 200, 900, 1300 & 1400
 - Uni-flange Series 1500 restraint joint for PVC pipe - 4" - 12"
 - Uni-flange Series 1390 restraint joint for PVC pipe

 - ROMAC INDUSTRIES – Grip Ring – 4" – 12"
RomaGrip PVC Restrainer 3" - 24".

 - STAR - Allgrip 3600 - 4" - 12" for C900 and ductile iron pipe
 - Series 1000 - 4" - 12" for C-900
 - Series 1100 - 4" - 12" for C-900/C-905
 - PVC Grip 3500 – 4" – 16" for C-900
 - Stargrip 3000 – 4" – 36" for D.I.P.

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12. VALVES

a. Gate Valves

Bronze Threaded - EMWD Standard Drawing B-590 thru B-344B
NRS - 1/2"

- HAMMOND VALVE COMPANY - Model: 606-125 psi
- MILWAUKEE VALVE COMPANY - Model: 105-200 psi
- STOCKHAM VALVE COMPANY - Model: B-103-200 psi

NRS - 3/4" - 1" - *To be used in customer side of meter installation only. EMWD Standard Drawing B-591

- AMERICAN VALVE COMPANY - Model: Milano, M-300
- FAIRBANKS VALVE - Model: 125-S 250
- *F&F VALVE - Model: 710-Brass
- *KITZ VALVE - Code No. 27 Fig. AKH
- MILWAUKEE VALVE - Model: 1105M & 105
- NIBCO VALVE - Model: T-113 Domestic
- *PIONEER ENTERPRISES - Model: GTI-0102 & 0103
- RED AND WHITE VALVE - Model: B-206
- STOCKHAM VALVE - Model: B-103
- WOLVERINE VALVE - Model: 50293

NRS 1-1/2" - 2"

- AMERICAN VALVE - Model: 3-F Bronze
- MILWAUKEE VALVE - Model: 1105M & 105
- NIBCO VALVE - Model: T-113, Domestic
- STOCKHAM VALVE - Model: B-103

Cast Iron with 2" Operating Nut - 2" Blow-offs

- IOWA VALVE - Model: List 14
- MUELLER VALVE - Model: A-2380-8 and A-2380-6
- CLOW VALVE
- RENSSELSER VALVE - Model: Ludlow, List 13A
- STOCKHAM VALVE

IBBM - Horizontal, Double-Disc IBBM with By-Pass - 24"

- AMERICAN FLOW SYSTEMS - Model: A.D. "50-Line"
- CLOW - Model: Clow F5070
- MUELLER VALVE COMPANY - Model: A-2380-6

Resilient Seat - Flanged

R.S.G.V. - AWWA C-509, AWWA C-515 and AWWA C-550.

To meet EMWD Spec. 15102, Size 4" - 36"

- AMERICAN AVK COMPANY - Model: 25 AVK
- AMERICAN FLOW CONTROL COMPANY - Model: AFC-500 for 4"-12" or Series 2500 for 4"-36"
- ACIPCO - Model: 82-200W-77785-7
- CLOW - Model: Clow RW, Class 150
- KENNEDY - Model: Kennedy RS, Class 150
- M&H - Model: M&H A-4067

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- MUELLER COMPANY - Model: A-2360
- STOCKHAM COMPANY - Model: Stockham G700-0
- TYLER - DRS 250
- WATEROUS COMPANY - Model: Waterous #AFC-500
- U.S. PIPE - Model: Metroseal, RS Class 150

b. Butterfly Valves

EMWD Spec. 15103 - Class 150, AWWA C-504

- AMERICAN FLOW CONTROL - Model: A.D. 150, Size 4" - 48"
- CLOW - Model: Clow BFV, Class 150, Size 4" - 72"
- DEZURIK COMPANY - Model: Dezurik BFV, Class 150, Size 4" - 20"
- KENNEDY (Mueller Co.) - Model: Kennedy BFV, Class 150, Size 4" - 72"
- CRISPIN (Previously CMB Industries) - K-FLO Model 500 Series, 3"-20" and K-FLO 47 Series, 24" - 48"
- KUBOTA - Model: Kubota BFV, Class 150, Size 24" - 48"
- M&H COMPANY - Model: 4500, Class 150, Size 4" - 24"
Model: 1450, Class 150B, Size 30" - 48"
- MUELLER COMPANY - Model: Mueller Lineseal III, Size 4" - 24"
Model: Mueller Lineseal III, Size 30" - 48" (with Ductile Iron Disc)
- PRATT VALVE COMPANY -
Model: Pratt Ground Hog BFV. Class 150 with no power operation allowed.
Size 4" - 12"
Model: Pratt Ground Hog with power operation allowed with knowledge of turns.
Size 14" - 48"
Model: Pratt Triton XR-70 with handwheel. Size 24" - 48"

Class 250

- DEZURIK - Model: Dezurik
- CRISPIN (Previously CMB Industries) - Model: K-FLO Model 500 series
- PRATT/WATTS - Model: H.P. 250

Coatings - All valves larger than 12" in diameter shall have all AWWA C-550 Ferrous parts epoxy coated thermosetting.

c. Check Valves - Bronze Threaded

Bronze Swing Check Valve - Threaded 3/4" thru 2"

- HAMMOND VALVE CO. - Model No. 946 Bronze
- MILWAUKEE VALVE CO. - Model No. 510 & 511
- STOCKHAM VALVE CO. - Model No. B-320

d. Check Valves Flanged

Check valves shall be single disc, swing type, with spring and lever when so specified on the Bidding Sheet. EMWD Spec. No. 15111

- -APCO VALVE CO.
- -CLOW CO.
- -KENNEDY VALVE CO.
- -M&H CO.
- -MUELLER CO.
- -STOCKHAM CO.

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- e. Ball Valves - AWWA C507
- LUNKENHEIMER COMPANY
 - MARPAC, INC.
 - VALVE TECHNOLOGY CO. - Models D-7410-7420 and D7421-7432 Series

Meter Ball Valves - with Handles

- A.Y. MCDONALD - Model 6101 MWH 3/4" and 1"
- THE FORD METER BOX CO., INC. - Model B13-332 W - 3/4"
Model B13-444 - 1"
- JAMES JONES - Model J1908W - 3/4" and 1"

- f. Detector Checks

Single Detector Check - Less By-Pass, EMWD Standard Drawing B-389, B-390, B-573 (4" - 10")

- AMES - Model: A113-225, A113-226
- Model: A113-227, A113-228
- Model: 1000 Epoxy Coated
- FEBCO - Model: 906-UL
- GLOBE - Model: B
- HERSEY - Model: EDC III
- KENNEDY - Model: Grinnell 1371-G
- PRATT-WATTS - Model: 07F-UL/FM approved.

Double Check Detector Assemblies - EMWD Standard Drawing B-657 (3/4" - 10")
PER LATEST EDITION OF USC – FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES."

Reduced Pressure Detector Assemblies

- AMES - Model: 5000 RPDA
- FEBCO - Model: 826YD
- HERSEY - Model: 6CM-RPDA
- PRATT-WATTS - Model: 909DDCM2, 909DDC

- g. Reduced Pressure Assemblies

(3/4" - 10") - For High Hazard Service
PER LATEST EDITION OF USC - FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES."

(2 1/2" - 10") - For Automatic Fire Sprinkler Systems containing Toxic Substances

- AMES - Model: 5000 RPDA
- FEBCO - Model: 826YD
- HERSEY - Model: 6CM RPDA
- PRATT-WATTS - Model: 909 Series

- h. Double Check Assemblies

(3/4" - 10") - For Non-Toxic Service

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PER LATEST EDITION OF USC - FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES."

(4" - 10") - For Automatic Sprinkler Systems containing Non-Toxic Substance

- AMES - Model: 3000 DCDA, 3000 DCDC
- CLA-VAL - Model: 16
- FEBCO - Model: 806 YD
- MUELLER - Model: Hersey DDCII
- WATTS - Model: 709DDC
- WILKINS - Model: DCDA

Double Check Detector Assemblies - EMWD Standard Drawing B-657 (3/4" - 10")

PER LATEST EDITION OF USC - FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES."

i. Plug Valves

(3" - 24") - Ballcentric

- HENRY PRATT CO. - Pratt Keystone - 580 Series, #898

*Other Manufacturers as Approved by Engineering

13. ZINC CAPS

- RELIANCE ZINC CAPS
- MARS ZINC CAPS

14. WIRING

a. Telemetry Cable

ALCATEL DEDW - Telemetry wire, Double jacketed, filled polyethylene jacket for burial 5-mil copper shield, solid strand 6-pair, 19 gauge copper wire Alcatel DEDW.
(Approximately 5,000 ft. Rolls)

Distributors - POWER AND TELEPHONE SUPPLY
Phone No. 1-800-451-4381

b. Telemetry Hardware

CHARLES INDUSTRIES - Pedestal Model No. CPLM8-1/GTE

ENTRELEC - Terminal Model No. M4/6.SNB 0115686.13

Terminal End Stop Model No. 114836.00

DIN Rail Model No. 101598.26

3M - Splice Kit Model No. 72-N2

Distributors - CHARLES INDUSTRIES
Phone No. (847) 806-6300

REXEL ESD ELECTRICAL
Phone No. (760) 747-2211

ROYAL WHOLESALE ELECTRIC
Phone No. (951) 683-6625

APPENDIX "A"

- c. Locating Wire - EMWD Std. Drawing B-656#14-1 UF Black Copper- Insulated Locating Wire
- d. Insulated CP Test Connections & Blow-Off Connections EMWD Std. Drawing B-582 & B-379
#4 HMW – Pe (High Molecular Wt-Polyethylene Coated) Stranded Wire Black #12 TW – Solid Wire – Green or Yellow
- e. Variable Frequency Drive

15. **VARIABLE FREQUENCY DRIVES (VFD's)**

Variable Frequency Drives

- ABB - Model ACS 600 Direct Torque Control up to 350 hp (Western Switch).
- ALLEN BRADLEY
- TOSHIBA

APPENDIX B

EMWD DE MINIMUS PERMIT



**California Regional Water Quality Control Board
Santa Ana Region**



Linda S. Adams
Secretary for
Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santana

Arnold Schwarzenegger
Governor

RECEIVED

MAY 14 2009

EMWD/MAILROOM

May 13, 2009

Khos Ghaderi, Director of Water Operations
Eastern Municipal Water District
P.O. Box 8300
Perris, CA 92572-8300

Recd. Electronic
To: Ghaderi, Khos
Javier, Alfred
Joy, Jayne

2009 MAY 13 PM 2:23

**DISCHARGE AUTHORIZATION AND MONITORING AND REPORTING PROGRAM
NO. R8-2009-0003-003, UNDER GENERAL PERMIT NO. R8-2009-0003, NPDES NO.
CAG998001, FOR EASTERN MUNICIPAL WATER DISTRICT, RIVERSIDE COUNTY**

Dear Mr. Ghaderi:

On May 11, 2009, you submitted a complete Notice of Intent to continue discharging wastewater from various sites under the terms and conditions of the Regional Board's renewed general permit, Order No. R8-2009-0003. This Order replaces Order No. R8-2003-0061, under which you previously had authorization to discharge.

Effective immediately, you are authorized to discharge wastewater under the terms and conditions of Order No. R8-2009-0003. Enclosed is Monitoring and Reporting Program (MRP) No. R8-2009-0003-003, which specifies the frequency of sampling and the constituents to be monitored. Modifications to the sampling frequency and constituents to be monitored can be considered on a case-by-case basis.

Please note that changes in the California Water Code require the Regional Board to assess a mandatory minimum penalty of \$3,000 for each month your monthly monitoring reports are overdue.

Order No. R8-2009-0003 will expire on March 1, 2014. If you wish to terminate coverage under this general permit prior to that time, please notify us immediately upon project completion so that we can rescind your authorization and avoid billing you an annual fee.

MAIL	ADD. INFO
BD	ORIG
CI	W/O
EN	W/E
EX	W/CK
FI	W/ENV
HR	W/MAF
LG	ADV. COPY
OP	<input checked="" type="checkbox"/>
RD	
SF	

California Environmental Protection Agency



The Riverside County Flood Control and Water Conservation District has requested that dischargers in Riverside County call Jason Uhley at (951) 955-1273 regarding local agency requirements for this discharge. If you have any questions regarding the Discharge Authorization or the M&RP, please contact Julio Lara of our Compliance Section at (951) 782-4901 or email at Jlara@waterbords.ca.gov.

Sincerely,



for Gerard J. Thibeault
Executive Officer

Enclosures: MRP No. R8-2009-0003-003

cc w/o enc: US EPA Permits Issuance Section (WTR-5) - Doug Eberhardt
Riverside County Flood Control and Water Conservation District - Jason Uhley

cc w/ enc: EMWD - Khos Ghaderi, ghaderik@emwd.org
EMWD - Jayne Joy, joyj@emwd.org
EMWD - Al Javier, javiera@emwd.org



Attachment E – Monitoring and Reporting Program

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Attachment E – Monitoring and Reporting Program (MRP)

The Code of Federal Regulations (CFR) at 40 CFR §122.48 requires that all NPDES permits specify monitoring and reporting requirements. CWC Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. General Monitoring Provision

1. All sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association).
2. All laboratory analyses^{1, 2} shall be performed in accordance with test procedures under 40 CFR 136 (revised as of April 11, 2007) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA), unless otherwise specified in this MRP. In addition, the Regional Water Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136.
3. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with the provision of Water Code Section 13176, or conducted at a laboratory certified for such analyses by the EPA or at laboratories approved by the Regional Water Board's Executive Officer.
4. In conformance with federal regulations 40 CFR 122.45(c), analyses to determine compliance with the effluent limitations for metals shall be conducted using the total recoverable method. For Chromium (VI), the dissolved method in conformance with 40 CFR 136 may be used to measure compliance with the Chromium (VI) limitation.

¹ For Selenium testing use modified EPA Method 200.8 using a Dynamic Reaction Cell (DRC) with an ICP-MS and with reporting limit below 1 ug/L

² For testing organic volatile compounds use EPA Method 8260B and report entire suite of detected constituents

5. The Discharger shall require its testing laboratory to calibrate the analytical system down to the minimum level (ML)³ specified in Attachment "H" for priority pollutants with effluent limitations in this Order, unless an alternative reporting level is approved by the Regional Water Board's Executive Officer. When there is more than one ML value for a given substance, the Discharger shall use the ML values, and their associated analytical methods, listed in Attachment "H" that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the lowest ML value and its associated analytical method, listed in Attachment "H" shall be used. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Water Board will reject the quantified laboratory data if quality control data is unavailable or unacceptable.
6. The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:
 - a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
 - b. Sample results less than the reported ML, but greater than or equal to the laboratory's current Method Detection Limit (MDL)⁴ shall be reported as "Detected, but Not Quantified," or "DNQ." The estimated chemical concentration of the sample shall also be reported.
 - c. Sample results not detected above the laboratory's MDL shall be reported as "not detected" or "ND."
7. The Discharger shall submit to the Regional Water Board reports necessary to determine compliance with effluent limitations in this Order. The Discharger shall report with each sample result:
 - a. The reporting level achieved by the testing laboratory; and
 - b. The laboratory's current MDL, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).

³ Minimum level is the concentration at which the entire analytical system must give a recognizable signal and acceptable point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

⁴ MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analytical concentration is greater than zero, as defined in 40 CFR 136, Appendix B, revised as of April 11, 2007.

8. For receiving water monitoring and for those priority pollutants without effluent limitations, the Discharger shall require its testing laboratory to quantify constituent concentrations to the lowest achievable MDL as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007)⁵. In situations where the most stringent applicable receiving water objective (freshwater or human health (consumption of organisms only), as specified for that pollutant in 40 CFR 131.38⁶ is below the minimum level value specified in Attachment "H" and the Discharger cannot achieve an MDL value for that pollutant below the ML value, the Discharger shall submit justification why a lower MDL value cannot be achieved. Justification shall be submitted together with monthly monitoring reports.
9. The Discharger shall have, and implement an acceptable written quality assurance (QA) plan for laboratory analyses. Duplicate chemical analyses must be conducted on a minimum of ten percent (10%) of the samples, or at least one sample per month, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples. When requested by the Regional Water Board or EPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study.
10. For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time, and an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when compliance with the time schedule has been achieved.
11. The Discharger shall assure that records of all monitoring information are maintained and accessible for a period of at least five years (this retention period supercedes the retention period specified in Section IV.A. of Attachment D) from the date of the sample, report, or application. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or by the request of the Regional Water Board at any time. Records of monitoring information shall include:
 - a. The information listed in Attachment D- IV Standard Provisions – Records, subparagraph B. of this Order;
 - b. The laboratory which performed the analyses;
 - c. The date(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The modification(s) to analytical techniques or methods used;
 - f. All sampling and analytical results, including
 - (1) Units of measurement used;
 - (2) Minimum reporting level for the analysis (minimum level);

⁵ For Selenium testing use modified EPA Method 200.8 using a Dynamic Reaction Cell (DRC) with an ICP-MS and with reporting limit below 1 ug/L

⁶ See Federal Register/ Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations.

- (3) Results less than the reporting level but above the method detection limit (MDL);
 - (4) Data qualifiers and a description of the qualifiers;
 - (5) Quality control test results (and a written copy of the laboratory quality assurance plan);
 - (6) Dilution factors, if used; and
 - (7) Sample matrix type.
 - g. All monitoring equipment calibration and maintenance records;
 - h. All original strip charts from continuous monitoring devices;
 - i. All data used to complete the application for this Order; and,
 - j. Copies of all reports required by this Order.
 - k. Electronic data and information generated by the Supervisory Control And Data Acquisition (SCADA) System.
12. The flow measurement system shall be calibrated at least once per year or more frequently, to ensure continued accuracy.
13. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. In the event that continuous monitoring equipment is out of service for greater than a 24-hour period, the Discharger shall obtain a representative grab sample each day the equipment is out of service. The Discharger shall correct the cause(s) of failure of the continuous monitoring equipment as soon as practicable. In its monitoring report, the Discharger shall specify the period(s) during which the equipment was out of service and if the problem has not been corrected, shall identify the steps which the Discharger is taking or proposes to take to bring the equipment back into service and the schedule for these actions.
14. Monitoring and reporting shall be in accordance with the following:
- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. The monitoring and reporting of influent, effluent, and sludge shall be done more frequently as necessary to maintain compliance with this Order and or as specified in this order.
 - c. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.
 - d. A "grab" sample is defined as any individual sample collected in less than 15 minutes.

- e. A composite sample is defined as a combination of no fewer than eight individual grab samples obtained over the specified sampling period. The volume of each individual grab sample shall be proportional to the discharge flow rate at the time of sampling. The compositing period shall equal the specific sampling period, or 24 hours, if no period is specified.
- f. Daily samples shall be collected on each day of the week.
- g. Monthly samples shall be collected on any representative day of each month.
- h. Quarterly samples: A representative sample shall be taken on any representative day of January, April, July, and October and test results shall be reported in either micrograms/liter (ug/L) or milligrams/liter (mg/L) or nanograms/L (ng/L), as appropriate, by the last day of the month following the month that the sample was taken.
- i. Semi-annual samples shall be collected in January and July.
- j. Annual samples shall be collected in January to December.

II. MONITORING LOCATIONS

The Discharger shall establish monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order. The sample station shall be located where representative samples of the discharge can be obtained. The volume of daily discharge shall be recorded daily on a permanent log.

III. INFLUENT MONITORING REQUIREMENTS – NOT APPLICABLE

IV. EFFLUENT MONITORING REQUIREMENTS

- A. The following shall constitute the effluent monitoring program for discharges other than decant filter backwash wastewater and/or sludge dewatering filtrate water. If there is no discharge see Section VIII.B.5., below.
 1. For intermittent (less than daily) discharge flow of less than 25,000 gallons per day (gpd), effluent monitoring is as follows:

Table 1. Effluent Monitoring Program for Flow Less than 25,000 GPD

Parameter	Unit	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and Minimum Level, units, respectively
Flow	gpd	measured	Each discharge event	--
Total Petroleum Hydrocarbons ⁷	µg/L	Grab	Once monthly, see also Section IV.A.3.	EPA METHOD 8015 Modified
Oil and Grease ⁸	mg/L	Grab	"	See Section I.A.2. above, of this MRP
Total Residual Chlorine ⁹	mg/L	Grab	"	See Section I.A.2. above, of this MRP
Total Suspended Solids	mg/L	"	"	"
Total Inorganic Nitrogen (TIN)	mg/L	"	Annually, see also Section IV.A.3.	"
Sulfate	mg/L	"	"	"
pH	Std. Units	"	"	"
Total Dissolved Solids	mg/L	Grab	Annually, see also Section IV.A.3.	"
Hardness ¹⁰	mg/L	"	"	"
Pollutants listed in Attachment "I"	µg/L	Grab	Once during the first ¹⁰ 30 minutes of the discharge and annually thereafter; see also Section IV.A.4. and IV.A.5.	See Section I.A.2. & I.A.3. above, of this MRP

⁷ Applies when dewatering operations are near suspected petroleum hydrocarbon contaminated sites or when diesel or gasoline powered generator is used in the dewatering operations.

⁸ Not applicable to discharges from established water supply systems where no oil and grease are expected.

⁹ Unless it is known that chlorine is not in the discharge.

¹⁰ If the pollutants were monitored at the outset during the application process, the Discharger may submit the analytical results in lieu of the first sampling event.

2. For discharge flow of 25,000 gpd or more, effluent monitoring is as follows:

Table 2. Effluent Monitoring Program for Flow Over 25,000 GPD

Parameter	Unit	Sample Type See also IV.A.6., below	Minimum Sampling Frequency	Required Analytical Test Method and Minimum Level, units, respectively
Flow	gpd	measured	Daily	--
Total Petroleum Hydrocarbons ¹¹	µg/L	Grab	During the first 30 minutes of the discharge, then monthly see also Section IV.A.3.	EPA METHOD 8015 Modified
Oil and Grease ¹²	mg/L	Grab	"	See Section I.A.3. above, of this MRP
Total Residual Chlorine ¹³	mg/L	Grab	"	See Section I.A.3. above, of this MRP
Total Suspended Solids	mg/L	"	During the first 30 minutes of each discharge event, then monthly, see also Section IV.A.3.	"
Total Inorganic Nitrogen (TIN)	mg/L	"	Semi-annually	"
pH	Std. Units	"	Semi-annually	"
Total Dissolved Solids	mg/L	Grab	Semi-annually	"
Hardness ¹⁵	mg/L	"	Semi-annually	"
Pollutants ¹⁴ listed in Attachment "I"	µg/L	Grab	Once during the first ¹⁵ 30 minutes of the discharge and annually thereafter; see also Section IV.A.4., and IV.A.5.	See Section I.A.2. & I.A.3. above, of this MRP

¹¹ Applies when dewatering operations are near suspected petroleum hydrocarbon contaminated sites or when diesel or gasoline powered generator is used in the dewatering operations.

¹² Not applicable to discharges from established water supply systems where no oil and grease are expected.

¹³ Unless it is known that chlorine is not in the discharge.

¹⁴ For testing organic volatile compounds use EPA Method 8260B and report entire suite of detected constituents.

¹⁵ If the pollutants were monitored at the outset during the application process, the Discharger may submit analytical results in lieu of the first sampling event.

3. Should any of the weekly, bi-monthly, monthly, quarterly or annual monitoring for a specific constituent show effluent concentrations above the effluent limit, the frequency of monitoring for that constituent shall be increased to weekly or as directed by the Executive Officer. To return to the monitoring frequency specified, the Discharger shall request and receive approval from the Regional Water Board's Executive Officer or designee. (See also Provision VII.C.6.a. of the Order regarding conditions that necessitate termination of the discharge.)
4. Should the annual monitoring for a specific constituent show effluent concentrations above the values specified in Attachment I, the monitoring frequency for that constituent shall be increased to weekly for one quarter or as directed by the Executive Officer. To return to the monitoring frequency specified, the Discharger shall request and receive approval from the Regional Water Board's Executive Officer or designee. (See also Provision VII.C.6.a. of the Order regarding conditions that necessitate termination of the discharge.)
5. Should two consecutive annual monitoring results for all the constituents specified in Attachment I show values below those listed in Attachment "I", the Discharger may stop monitoring for the pollutants listed in Attachment I.
6. If the discharge does not last for more than a day, one composite sample shall be taken for the duration of the discharge and shall be analyzed.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS – NOT APPLICABLE

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE.

VII. RECEIVING WATER MONITORING REQUIREMENTS

Whenever there is a discharge and the Discharger asserts that there are no surface waters at the point where the discharge reaches the stream, the Discharger shall record on a permanent log the following information: (a) the date(s), time(s), and duration(s) of the discharge; (b) a description of the location where the discharge(s) percolated into the ground, (c) the climatic condition in the area during the discharge and (d) the name of the individual(s) who performed the observation. This information shall be submitted with the required quarterly report.

VIII. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. All analytical data shall be reported with method detection limit¹⁶ (MDLs) and with identification of either reporting level or limits of quantitation (LOQs).
3. Laboratory data for effluent samples must quantify each constituent down to the down to ML specified in Attachment "H" for priority pollutants. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Water Board will reject the quantified laboratory data if quality control data are unavailable or unacceptable.
4. Discharge monitoring data shall be submitted in a format acceptable to the Regional Water Board. Specific reporting format may include preprinted forms and/or electronic media. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order.
5. The Discharger shall submit to the Regional Water Board reports necessary to determine compliance with effluent limitations in this Order and shall follow the chemical nomenclature and sequential order of priority pollutant constituents shown in Attachment "G" – Priority Pollutant Lists. The Discharger shall report with each sample result:
 - a. The reporting level achieved by the testing laboratory; and
 - b. The laboratory's current MDL, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).
6. For non-priority pollutants monitoring, all analytical data shall be reported with identification of method detection limits, as determined by the procedure found in 40 CFR 136 (revised as of April 11, 2007).
7. The State or Regional Water Board may notify the Discharger to discontinue submittal of hard copies of reports. When such notification is given, the Discharger shall stop submitting hard copies of required monitoring reports.

B. Reporting Requirements:

1. All monitoring reports, or information submitted to the Regional Water Board shall be signed and certified in accordance with 40 CFR 122.22 and shall be submitted under penalty of perjury.
2. All reports shall be arranged in a tabular format to clearly show compliance or noncompliance with each discharge limitation.

¹⁶

The standardized test procedure to be used to determine the method detection limit (MDL) is given at Appendix B, 'Definition and Procedure for the Determination of the Method Detection Limit' of 40 CFR 136.

3. Five days prior to any discharge from locations already reported, the Discharger shall notify the Regional Board staff by phone or by a fax letter indicating the date and time of the proposed discharge.
4. Five days prior to any planned discharge¹⁷ from locations not yet reported, the discharger shall notify the Regional Board staff by phone or by a fax letter indicating the following:
 - a. Specific type of the proposed wastewater discharge (see listing on Finding 1 of the Order);
 - b. The estimated average and maximum daily flow rates;
 - c. The frequency and duration of the discharge;
 - d. The affected receiving water(s);
 - e. A description of the proposed treatment system (if appropriate); and
 - f. A description of the path from the point of initial discharge to the ultimate location of discharge (fax a map if possible);
5. If no discharge occurs during the previous monitoring period, a letter to that effect shall be submitted in lieu of a monitoring report specified in Table 4, below.
6. Noncompliance Reporting
 - a. The discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided to the Executive Officer (951-782-4130) and the Office of Emergency Services (1-800-852-7550) orally within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue, and, steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - b. Any violation of a maximum daily discharge limitation for any of the pollutants listed in this Order shall be included as information that must be reported within 24 hours.
 - c. The Regional Water Board may waive the above required written report on a case-by-case basis.

¹⁷ For those unplanned discharges, as much prior notification as possible is required before any discharge is initiated.

7. Except for data determined to be confidential under Section 308 of the Clean Water Act (CWA), all reports prepared in accordance with the terms of this Order shall be available for public inspection at the offices of the Regional Water Quality Control Board and the Regional Administrator of EPA. As required by the CWA, effluent data shall not be considered confidential.
8. Monitoring reports shall be submitted by the 30th day of each month following the monitoring period and shall include:
 - a. The results of all chemical analyses for the previous month, and annual samples whenever applicable,
 - b. The daily flow data,
 - c. A summary of the month's activities including a report detailing compliance or noncompliance with the task for the specific schedule date, and
 - d. For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, and of the actions undertaken or proposed which will bring the discharger into full compliance with requirements at the earliest time, and an estimate of the date when the discharger will be in compliance. The discharger shall notify the Regional Water Board by letter when compliance with the time schedule has been achieved.
9. For Dischargers discharging at a volume equal to or greater than 150,000 gallons per day, the Discharger shall submit semi-annual reports that tabulate all measured flows and measured parameters within the most recent six month period. Where discharges associated with these projects last less than 6 months, a report covering the period of discharges shall be submitted. Copies of these monitoring reports shall be submitted to the Regional Water Board and to the Water Quality Director of the Orange County Water District at P.O. Box 8300, Fountain Valley, CA 92728-8300.

C. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Discharger shall submit hard copy SMRs in accordance with the requirements described in subsection B.5 below. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.
2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. Additionally, the Discharger shall report in the SMR the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions – VI.C. of this Order. The Discharger shall submit monthly, quarterly, and annual SMRs including

the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

- Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table 3. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Day after permit effective date	All	30 th day of the month following the sampling month.
Hourly	Day after permit effective date	Hourly	30 th day of the month following the sampling month.
Daily	Day after permit effective date	Midnight through 11:59 PM or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	30 th day of the month following the sampling month.
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	30 th day of the month following the sampling month.
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1 st day of calendar month through last day of calendar month	30 th day of the month following the sampling month.
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	April 30 July 30 October 30 January 30
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	July 30 January 30
Annually	See Table 1	See Table 1	30 th day of the month following the sampling month.
Per Discharge Event	Anytime during the discharge event or as soon as possible after aware of the event	At a time when sampling can characterize the discharge event	30 th day of the month following the sampling month.

D. Other Reports – Not Applicable

Add to the 1st table in section 1-1.06:

04-19-13

LCS	Department's lane closure system
POC	pedestrian overcrossing
QSD	qualified SWPPP developer
QSP	qualified SWPPP practitioner
TRO	time-related overhead
WPC	water pollution control

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

06-20-12

Delete "Contract completion date" and its definition in section 1-1.07B.

10-19-12

Delete "critical delay" and its definition in section 1-1.07B.

10-19-12

Replace "day" and its definition in section 1-1.07B with:

10-19-12

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

1. **business day:** Day on the calendar except a Saturday and a holiday.
2. **working day:** Time measure unit for work progress. A working day is any 24-consecutive-hour period except:
 - 2.1. Saturday and holiday.
 - 2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
 - 2.2.1. Adverse weather-related conditions.
 - 2.2.2. Maintaining traffic under the Contract.
 - 2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
 - 2.2.4. Unanticipated event not caused by either party such as:
 - 2.2.4.1. Act of God.
 - 2.2.4.2. Act of a public enemy.
 - 2.2.4.3. Epidemic.
 - 2.2.4.4. Fire.
 - 2.2.4.5. Flood.
 - 2.2.4.6. Governor-declared state of emergency.
 - 2.2.4.7. Landslide.
 - 2.2.4.8. Quarantine restriction.
 - 2.2.5. Issue involving a third party, including:
 - 2.2.5.1. Industry or area-wide labor strike.
 - 2.2.5.2. Material shortage.
 - 2.2.5.3. Freight embargo.
 - 2.2.5.4. Jurisdictional requirement of a law enforcement agency.
 - 2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.
 - 2.3. Day during a concurrent delay.
3. **original working days:**

- 3.1. Working days to complete the work shown on the *Notice to Bidders* for a non-cost plus time based bid.
- 3.2. Working days bid to complete the work for a cost plus time based bid.

Where working days is specified without the modifier "original" in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.

Replace "Contract" in the definition of "early completion time" in section 1-1.07B with:

work

10-19-12

Replace "excusable delay" and its definition in section 1-1.07B with:

delay: Event that extends the completion of an activity.

10-19-12

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

Replace "project" in the definition of "scheduled completion date" in section 1-1.07B with:

work

10-19-12

Add to section 1-1.07B:

Contract time: Number of original working days as adjusted by any time adjustment.

10-19-12

Disadvantaged Business Enterprise: Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

06-20-12

Replace "PO BOX 911" in the District 3 mailing address in the table in section 1-1.08 with:

703 B ST

04-20-12

Replace the Web site for the Department of General Services, Office of Small Business and DVBE Services in the table in section 1-1.11 with:

<http://www.dgs.ca.gov/dgs/ProgramsServices/BusServices.aspx>

11-15-13

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

2 BIDDING

02-21-14

Replace the headings and paragraphs in section 2 with:

02-21-14

2-1.01 GENERAL

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

The electronic bid specifications in section 2 apply if *Electronic Bidding Contract* is shown on the cover of the *Notice to Bidders and Special Provisions*.

2-1.02 BID INELIGIBILITY

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

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

2-1.03–2-1.05 RESERVED

2-1.06 BID DOCUMENTS

2-1.06A General

Standard Specifications and Standard Plans may be viewed at the Bidders' Exchange website and may be purchased at the Publication Distribution Unit.

The *Notice to Bidders and Special Provisions* and project plans may be viewed at the Bidders' Exchange website and at the street address.

Bid books may be ordered at the Bidders' Exchange website.

For an informal-bid contract, in addition to viewing and ordering them as specified above, the *Notice to Bidders and Special Provisions*, project plans, and *Bid* book may be obtained at the Bidders' Exchange street address.

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

2-1.06B Supplemental Project Information

The Department makes supplemental information available as specified in the special provisions.

Logs of test borings are supplemental project information.

If an *Information Handout* or cross sections are available:

1. You may view them at the Contract Plans and Special Provisions link at the Bidders' Exchange website
2. For an informal-bid contract, you may obtain them at the Bidders' Exchange street address

If rock cores are available, you may view them by sending a request to Coreroom@dot.ca.gov.

If other supplemental project information is available for inspection, you may view it by phoning in a request.

Make your request at least 7 days before viewing. Include in your request:

1. District-County-Route
2. Contract number
3. Viewing date
4. Contact information, including telephone number

For rock cores, also include the bridge number in your request.

If bridge as-built drawings are available:

1. For a project in District 1 through 6 or 10, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357
2. For a project in District 7, 8, 9, 11, or 12, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357, and they are available at the Office of Structure Maintenance and Investigations, Los Angeles, CA, telephone (213) 897-0877

As-built drawings may not show existing dimensions and conditions. Where new construction dimensions are dependent on existing bridge dimensions, verify the field dimensions and adjust dimensions of the work to fit existing conditions.

2-1.06C--2-1.06D Reserved

2-1.07 JOB SITE AND DOCUMENT EXAMINATION

Examine the job site and bid documents.

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

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

2-1.08 RESERVED

2-1.09 BID ITEM LIST

Submit a bid based on the bid item quantities the Department shows on the Bid Item List.

2-1.10 SUBCONTRACTOR LIST

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

The Subcontractor List form must show the name, address, and work portions to be performed by each subcontractor listed. Show work portions by bid item number, description, and percentage of each bid item subcontracted.

2-1.11 RESERVED

2-1.12 DISADVANTAGED BUSINESS ENTERPRISES

2-1.12A General

Section 2-1.12 applies to a federal-aid contract.

Under 49 CFR 26.13(b):

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

Take necessary and reasonable steps to ensure that DBEs have opportunity to participate in the Contract (49 CFR 26).

2-1.12B Disadvantaged Business Enterprise Goal

2-1.12B(1) General

Section 2-1.12B applies if a DBE goal is shown on the *Notice to Bidders*.

To ensure equal participation of DBEs provided in 49 CFR 26.5, the Department shows a goal for DBEs.

Make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers.

Meet the DBE goal shown on the *Notice to Bidders* or demonstrate that you made adequate good faith efforts to meet this goal.

You are responsible to verify that the at the bid opening date the DBE firm is certified as DBE by the CA Unified Certification Program.

All DBE participation will count toward the Department's federally-mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs counts toward the goal in the following manner:

1. 100 percent if the materials or supplies are obtained from a DBE manufacturer.
2. 60 percent if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies, if they are obtained from a DBE that is neither a manufacturer nor regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit toward the goal if you employ a DBE trucking company that performs a commercially useful function as defined in 49 CFR 26.55(d)(1)-(4), (6).

2-1.12B(2) DBE Commitment Submittal

Submit DBE information under section 2-1.33.

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.

Submit written confirmation from each DBE shown on the form stating that it will be participating in the Contract. Include confirmation with the DBE commitment form. A copy of a DBE's quote will serve as written confirmation that the DBE will be participating in the Contract.

2-1.12B(3) Good Faith Efforts Submittal

If you have not met the DBE goal, complete and submit the Good Faith Efforts Documentation under section 2-1.33 showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed toward obtaining participation by DBEs are considered.

If your DBE commitment form shows that you have met the DBE goal or if you are required to submit the DBE commitment form, you must submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the Department finds that the DBE goal has not been met.

The Department may consider DBE commitments of the 2nd and 3rd bidders in determining whether the low bidder made good faith efforts to meet the DBE goal.

2-1.13-2-1.14 RESERVED

2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES

2-1.15A General

Section 2-1.15 applies to a non-federal-aid contract.

Take necessary and reasonable steps to ensure that DVBEs have opportunity to participate in the Contract.

Comply with Mil & Vet Code § 999 et seq.

2-1.15B Projects \$5 Million or Less

Section 2-1.15B applies to a project with an estimated cost of \$5 million or less.

Make work available to DVBEs and select work parts consistent with available DVBE subcontractors and suppliers.

Meet the goal shown on the *Notice to Bidders*.

Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.

If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.

List each 1st-tier DVBE subcontractor on the Subcontractor List form regardless of percentage of the total bid.

2-1.15C Projects More Than \$5 Million

2-1.15C(1) General

Section 2-1.15C applies to a project with an estimated cost of more than \$5 million.

The Department encourages bidders to obtain DVBE participation to ensure the Department achieves its State-mandated overall DVBE goal.

If you obtain DVBE participation:

1. Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.
2. List each 1st tier DVBE subcontractor in the Subcontractor List form regardless of percentage of the total bid.

If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.

2-1.15C(2) DVBE Incentive

The Department grants a DVBE incentive to each bidder who achieves a DVBE participation of 1 percent or greater (Mil & Vet Code 999.5 and Code of Regs § 1896.98 et seq.).

To receive this incentive, submit the Certified DVBE Summary form under section 2-1.33.

Bidders other than the apparent low bidder, the 2nd low bidder, and the 3rd low bidder may be required to submit the Certified DVBE Summary form if the bid ranking changes. If the Department requests a Certified DVBE Summary form from you, submit the completed form within 4 business days of the request.

2-1.15C(3) Incentive Evaluation

The Department applies the small business and non-small business preference during bid verification and proceeds with the evaluation specified below for DVBE incentive.

The DVBE incentive is a reduction, for bid comparison only, in the total bid submitted by the lesser of the following amounts:

1. Percentage of DVBE achievement rounded to 2 decimal places of the verified total bid of the low bidder
2. 5 percent of the verified total bid of the low bidder
3. \$250,000

The Department applies DVBE incentive and determines whether bid ranking changes.

A non-small business bidder cannot displace a small business bidder. However, a small business bidder with higher DVBE achievement can displace another small business bidder.

The Department proceeds with awarding the contract to the new low bidder and posts the new verified bid results at the Department's Web site.

2-1.16–2-1.17 RESERVED

2-1.18 SMALL BUSINESS AND NON–SMALL BUSINESS SUBCONTRACTOR PREFERENCES

2-1.18A General

Section 2-1.18 applies to a non-federal-aid contract.

The Department applies small business preferences and non–small business preferences under Govt Code § 14835 et seq. and 2 CA Code of Regs § 1896 et seq.

Any contractor, subcontractor, supplier, or service provider who qualifies as a small business is encouraged to apply for certification as a small business by submitting its application to the Department of General Services, Office of Small Business and DVBE Services.

Contract award is based on the total bid, not the reduced bid.

2-1.18B Small Business Preference

The Department allows a bidder certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:

1. Bidder submitted a completed Request for Small Business Preference or Non–Small Business Preference form with its bid
2. Low bidder did not request the preference or is not certified as a small business

The bidder's signature on the Request for Small Business Preference or Non–Small Business Preference form certifies that the bidder is certified as a small business at the date and time of bid or has submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The Department of General Services determines whether a bidder was certified on the bid opening date. The Department of Transportation confirms the bidder's status as a small business before applying the small business preference.

The small business preference is a reduction for bid comparison in the total bid submitted by the small business contractor by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. \$50,000

If the Department determines that a certified small business bidder is the low bidder after the application of the small business preference, the Department does not consider a request for non–small business preference.

2-1.18C Non–Small Business Subcontractor Preference

The Department allows a bidder not certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:

1. Bidder submitted a completed Request for Small Business Preference or Non–Small Business Preference form with its bid
2. Certified Small Business Listing for the Non–Small Business Preference form shows that you are subcontracting at least 25 percent to certified small businesses

Each listed subcontractor and supplier must be certified as a small business at the date and time of bid or must have submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The non-small business subcontractor preference is a reduction for bid comparison in the total bid submitted by the non-small business contractor requesting the preference by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. \$50,000

2-1.19–2-1.26 RESERVED

2-1.27 CALIFORNIA COMPANIES

Section 2-1.27 applies to a non-federal-aid contract.

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

Complete a California Company Preference form.

The California company reciprocal preference amount is equal to the preference amount applied by the state of the nonresident contractor with the lowest responsive bid unless the California company is eligible for a small business preference or a non-small business subcontractor preference, in which case the preference amount is the greater of the two, but not both.

If the low bidder is not a California company and a California company's bid with reciprocal preference is equal to or less than the lowest bid, the Department awards the contract to the California company on the basis of its total bid.

2-1.28 RESERVED

2-1.29 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

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

2-1.30–2-1.32 RESERVED

2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL

Complete forms in the *Bid* book.

For a paper bid, submit your bid:

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

For an electronic bid, complete and submit the *Bid* book under the *Electronic Bidding Guide* at the Bidders' Exchange website.

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

Bid Form Submittal Schedule				
Contract type	Forms to be submitted at the time of bid	Forms to be submitted no later than 24 hours after bid opening ^a	Forms to be submitted no later than 4 p.m. on the 2nd business day after bid opening ^a	Forms to be submitted no later than 4 p.m. on the 4th business day after bid opening ^a
All contracts	<ul style="list-style-type: none"> • Bid to the Department of Transportation • Business name and location; description of subcontracted work on the Subcontractor List • Opt Out of Payment Adjustments for Price Index Fluctuations^c 	<ul style="list-style-type: none"> • Bid item nos. and percentage of bid item subcontracted on the SubcontractorList^b 	--	--
Non-federal-aid contracts only	<ul style="list-style-type: none"> • California Company Preference • Request for Small Business Preference or Non-Small Business Preference^c 	--	<ul style="list-style-type: none"> • Certified Small Business Listing for the Non-Small Business Preference^c 	<ul style="list-style-type: none"> • Certified DVBE Summary^d
Federal-aid contracts only	<ul style="list-style-type: none"> • Small Business Status 	--	--	<ul style="list-style-type: none"> • Caltrans Bidder - DBE - Commitment^e • Good Faith Efforts Documentation - DBE^f

^aThe forms and information may be submitted at the time of bid.

^bIf the information is not submitted at the time of bid, fax it to (916) 227-6282. This after-bid submittal does not apply to an informal-bid contract. For an informal bid contract, submit the completed form at the time of bid.

^cApplicable only if the preference or option is chosen.

^dNot applicable to an informal-bid contract or a project with an estimated cost of more than \$5 million. For an informal bid contract, submit the completed form at the time of bid. For a project with an estimated cost of more than \$5 million, applicable only if you obtain DVBE participation or you are the apparent low bidder, 2nd low bidder, or 3rd low bidder and you choose to receive the specified incentive.

^eIf not submitted at the time of bid, applicable only to the apparent low bidder, 2nd low bidder, and 3rd low bidder.

^fApplicable only if you have not met the DBE goal.

For an electronic bid:

1. Forms to be submitted at the time of bid must be submitted as described in the *Electronic Bidding Guide* or faxed to (916) 227-6282 before the bid opening date and time.
2. Your authorized digital signature is your confirmation of and agreement to all certifications and statements contained in the *Bid* book.
3. On forms and certifications that you submit through the electronic bidding service, you agree that each form and certification where a signature is required is deemed as having your signature. On forms that you submit after bid opening, sign the forms where a signature is required in ink.

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

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

2-1.34 BIDDER'S SECURITY

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

1. Cash
2. Cashier's check
3. Certified check
4. Signed bidder's bond by an admitted surety insurer
5. For an electronic bid, electronic bidder's bond by an admitted surety insurer submitted using an electronic registry service approved by the Department.

Submit cash, cashier's check, certified check, or bidder's bond to the Department at the Bidders Exchange before the bid opening time.

Submit electronic bidder's bond with the electronic bid.

If using a bidder's bond, you may use the form in the *Bid* book. If you do not use the form in the *Bid* book, use a form containing the same information.

2-1.35–2-1.39 RESERVED

2-1.40 BID WITHDRAWAL

For a paper bid:

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

For an electronic bid:

1. Bids are not filed with the Department until the date and time of bid opening.
2. A bidder may withdraw or revise a bid after it has been submitted to the electronic bidding service if this is done before the bid opening date and time.

2-1.41–2-1.42 RESERVED

2-1.43 BID OPENING

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

2-1.44–2-1.45 RESERVED

2-1.46 DEPARTMENT'S DECISION ON BID

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

The Department may reject:

1. All bids
2. A nonresponsive bid

2-1.47 BID RELIEF

The Department may grant bid relief under Pub Cont Code § 5100 et seq. Submit any request for bid relief to the Office Engineer. The Relief of Bid Request form is available at the Department's website.

2-1.48 RESERVED

2-1.49 SUBMITTAL FAILURE HISTORY

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

2-1.50 BID RIGGING

Section 2-1.50 applies to a federal-aid contract.

The U.S. Department of Transportation (DOT) provides a toll-free hotline to report bid rigging activities. Use the hotline to report bid rigging, bidder collusion, and other fraudulent activities. The hotline number is (800) 424-9071. The service is available 24 hours 7 days a week and is confidential and anonymous. The hotline is part of the DOT's effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

3 CONTRACT AWARD AND EXECUTION

02-21-14

Replace section 3-1.02 with:

02-21-14

3-1.02 CONSIDERATION OF BIDS

3-1.02A General

For a lump sum based bid, the Department compares bids based on the total price.

For a unit price based bid, the Department compares bids based on the sum of the item totals.

For a cost plus time based bid, the Department compares bids based on the sum of the item totals and the total bid for time.

3-1.02B Tied Bids

The Department breaks a tied bid with a coin toss except:

- 1. If a small business bidder and a non-small business bidder request preferences and the reductions result in a tied bid, the Department awards the contract to the small business bidder.
- 2. If a DVBE small business bidder and a non-DVBE small business bidder request preferences and the reduction results in a tied bid, the Department awards the contract to the DVBE small business bidder.

Add to the end of section 3-1.04:

10-19-12

You may request to extend the award period by faxing a request to (916) 227-6282 before 4:00 p.m. on the last day of the award period. If you do not make this request, after the specified award period:

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

Replace the paragraph in section 3-1.11 with:

10-19-12

Complete and deliver to the Office Engineer a *Payee Data Record* when requested by the Department.

Replace section 3-1.13 with:

07-27-12

3-1.13 FORM FHWA-1273

For a federal-aid contract, form FHWA-1273 is included with the Contract form in the documents sent to the successful bidder for execution. Comply with its provisions. Interpret the training and promotion section as specified in section 7-1.11A.

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

30

06-20-12

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

Performance of

06-20-12

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

06-20-12

Replace the 3rd paragraph of section 5-1.13B(2) with:

06-20-12

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or obtain materials from other sources without authorization from the Department.

Replace item 6 in the list in the 4th paragraph of section 5-1.13B(2) with:

06-20-12

6. Listed DBE is ineligible to work on the project because of suspension or debarment.

Add to the list in the 4th paragraph of section 5-1.13B(2):

06-20-12

8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. Department determines other documented good cause.

Add between the 4th and 5th paragraphs of section 5-1.13B(2):

07-20-12

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the Department of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

1. 1 or more of the reasons listed in the preceding paragraph
2. Notices from you to the DBE regarding the request
3. Notices from the DBE to you regarding the request

Add between "terminated" and ", you" in the 5th paragraph of section 5-1.13B(2):

07-20-12

or substituted

Replace the paragraphs of section 5-1.13C with:

11-15-13

Section 5-1.13C applies to a non-federal-aid contract.

Use each DVBE as shown on the *Certified DVBE Summary* form unless you receive authorization from the Department for a substitution. The substitute must be another DVBE unless DVBEs are not available, in which case, you must substitute with a small business. Any authorization for a substitute is contingent upon the Department of General Services' approval of the substitute.

The requirement that DVBEs be certified by the bid opening date does not apply to DVBE substitutions after Contract award.

The Department authorizes substitutions for any of the reasons provided in 2 CA Code of Regs § 1896.73.

Include in your substitution request:

1. Copy of the written notice issued to the DVBE with proof of delivery
2. Copy of the DVBE's response to the notice
3. Name and certification number of the listed DVBE and the proposed substitute

Requests for substitutions of a listed DVBE with a small business must include documentation of the unavailability of DVBEs, including:

1. Contact with the small business/DVBE advocate from the Department and the Department of Veterans Affairs
2. Search results from the Department of General Services' website of available DVBEs
3. Communication with a DVBE community organization nearest the job site, if applicable
4. Documented communication with the DVBE and small businesses describing the work to be performed, the percentage of the total bid, the corresponding dollar amount, and the responses to the communication

The Department forwards your substitution request to the Department of General Services. The Department of General Services issues a notice of approval or denial. The Department provides you this notice.

If you fail to use a listed DVBE without an authorized substitution request, the Department issues a penalty of up to 10 percent of the dollar amount of the work of the listed DVBE.

Maintain records of subcontracts made with DVBEs. Include in the records:

1. Name and business address of each business
2. Total amount paid to each business

For the purpose of determining compliance with Pub Cont Code § 10115 et seq.:

1. Upon work completion, complete and submit *Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects Only* form.
2. Upon reasonable notice and during normal business hours, permit access to its premises for the purposes of:
 - 2.1. Interviewing employees.
 - 2.2. Inspecting and copying books, records, accounts and other material that may be relevant to a matter under investigation.

Replace "Reserved" in section 5-1.20C with:

10-19-12

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

Add between the 2nd and 3rd paragraphs of section 5-1.23A:

Submit action and informational submittals to the Engineer.

10-19-12

Add between the 5th and 6th paragraphs of section 5-1.23B(1):

For a revised submittal, allow the same number of days for review as for the original submittal.

07-19-13

Delete the 1st sentence in the 10th paragraph of section 5-1.23B(2).

07-19-13

Add to the list in the 1st paragraph of section 5-1.36A:

10. Survey monuments

07-19-13

Add to section 5-1.36C:

If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property.

07-20-12

Prevent material, equipment, and debris from falling onto railroad property.

Add to section 5-1.36:

07-19-13

5-1.36E Survey Monuments

Protect survey monuments on and off the highway. Upon discovery of a survey monument not identified and located immediately:

1. Stop work near the monument
2. Notify the Engineer

Do not resume work near the monument until authorized.

Add between the 1st and 2nd paragraphs of section 5-1.37A:

Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.

10-19-12

Replace the 1st sentence of the 1st paragraph of section 5-1.39C(2) with:

Section 5-1.39C(2) applies if a plant establishment period of 3 years or more is shown on the *Notice to Bidders*.

10-19-12

Replace "working days" in the 1st paragraph of section 5-1.43E(1)(a) with:

original working days

10-19-12

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

6 CONTROL OF MATERIALS

07-19-13

Replace section 6-2.05C with:

6-2.05C Steel and Iron Materials

04-19-13

Steel and iron materials must be melted and manufactured in the United States except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or \$2,500, materials produced outside the United States may be used if authorized

Furnish steel and iron materials to be incorporated into the work with certificates of compliance and certified mill test reports. Mill test reports must indicate where the steel and iron were melted and manufactured.

All melting and manufacturing processes for these materials, including an application of a coating, must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

Replace "Precast concrete members specified section 11-2" in the table in section 6-3.05B with:

Precast concrete members specified as tier 1 or tier 2 in section 90-4.01D(1)

07-19-13

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

07-19-13

Replace "\$50" in the 1st sentence in the 6th paragraph of section 7-1.02K(2) with:

\$200

07-19-13

Replace "\$25" in the 2nd sentence in the 13th paragraph of section 7-1.02K(3) with:

\$100

07-19-13

Replace "20 days" in the 14th paragraph of section 7-1.04 with:

25 days

09-16-11

Replace "90 days" in the 14th paragraph of section 7-1.04 with:

125 days

09-16-11

Add between the 18th and 19th paragraphs of section 7-1.04:

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

09-16-11

Replace the 2nd paragraph of section 7-1.11A with:

A copy of form FHWA-1273 is included in section 7-1.11B. The training and promotion section of section II refers to training provisions as if they were included in the special provisions. The Department specifies the provisions in section 7-1.11D of the *Standard Specifications*. If a number of trainees or apprentices is required, the Department shows the number on the *Notice to Bidders*. Interpret each FHWA-1273 clause shown in the following table as having the same meaning as the corresponding Department clause:

07-27-12

FHWA-1273 Nondiscrimination Clauses

FHWA-1273 section	FHWA-1273 clause	Department clause
Training and Promotion	In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.	If section 7-1.11D applies, section 7-1.11D supersedes this subparagraph.
Records and Reports	If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.	If the Contract requires on-the-job training, collect and report training data.

Replace the form in section 7-1.11B with:

07-20-12

**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

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.

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable 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.

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).

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 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.

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.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier 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.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the 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.

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).

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.

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.

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 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).

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.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

8 PROSECUTION AND PROGRESS

10-19-12

Replace "working days" in the 1st paragraph of section 8-1.02B(1) with:

original working days

10-19-12

Replace "working days" at each occurrence in the 1st paragraph of section 8-1.02C(1) with:

original working days

10-19-12

Delete the 4th paragraph of section 8-1.02C(1).

04-20-12

Replace "Contract" in the 9th paragraph of section 8-1.02C(1) with:

work

10-19-12

Replace the 1st paragraph of section 8-1.02C(3)(a) with:

Submit a description of your proposed schedule software for authorization.

04-20-12

Delete the last paragraph of section 8-1.02C(3)(a).

04-20-12

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

8-1.02C(3)(b) Reserved

10-19-12

Delete the 3rd paragraph of section 8-1.02C(5).

04-20-12

Replace "Contract" in the last paragraph of section 8-1.02C(5) with:

original

10-19-12

Replace "working days" in the 1st paragraph of section 8-1.02D(1) with:

original working days

10-19-12

Replace "8-1.02D(1)" in the 2nd paragraph of section 8-1.02D(1) with:

8-1.02C(1)

01-20-12

Replace "Contract" in the 3rd paragraph of section 8-1.02D(2) with:

work

10-19-12

Replace "Contract" in item 9 in the list in the 4th paragraph of section 8-1.02D(4) with:

work

10-19-12

Replace "Contract completion" in the 4th paragraph of section 8-1.02D(6) with:

work completion

10-19-12

Replace "Contract working days" in the 4th paragraph of section 8-1.02D(6) with:

original working days

10-19-12

Delete items 1.3 and 1.4 in the list in the 1st paragraph of section 8-1.02D(10).

04-20-12

Replace the last paragraph of section 8-1.04B with:

The Department does not adjust time for starting before receiving notice of Contract approval.

10-19-12

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

Contract time starts on the last day specified to start job site activities in section 8-1.04 or on the day you start job site activities, whichever occurs first.

10-19-12

Replace the 2nd paragraph of section 8-1.05 with:

Complete the work within the Contract time.

10-19-12

Delete "unless the Contract is suspended for reasons unrelated to your performance" in the 4th paragraph of section 8-1.05.

10-19-12

Replace the headings and paragraphs in section 8-1.06 with:

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

10-19-12

The Engineer may suspend work wholly or in part due to your failure to (1) fulfill the Engineer's orders, (2) fulfill a Contract part, or (3) perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur. The Department may provide for a

Add to the end of section 9-1.04A:

10-19-12

For nonsubcontracted work paid by force account for a contract with a TRO bid item, the markups are those shown in the following table instead of those specified in sections 9-1.04B–D:

Cost	Percent markup
Labor	30
Materials	10
Equipment rental	10

Delete ", Huntington Beach," in the 3rd paragraph of section 9-1.07A.

04-20-12

Replace the formula in section 9-1.07B(2) with:

$$Q_h = HMATT \times X_a$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_a in section 9-1.07B(2) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(3) with:

$$Q_{rh} = RHMATT \times 0.80 \times X_{arb}$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_{arb} in section 9-1.07B(3) with:

total weight of rubberized HMA

04-20-12

Replace the heading of section 9-1.07B(4) with:

Hot Mix Asphalt with Modified Asphalt Binder

04-20-12

Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):

HMA with

04-20-12

Replace the formula in section 9-1.07B(4) with:

$$Q_{mh} = MHMATT \times [(100 - X_{am}) / 100] \times X_{mab}$$

04-20-12

Replace "weight of dry aggregate" in the definition of the variable X_{mab} in section 9-1.07B(4) with:

total weight of HMA

04-20-12

Replace the formula in section 9-1.07B(5) with:

04-20-12

$$Qrap = HMATT \times Xaa$$

Replace "weight of dry aggregate" in the definitions of the variables *Xaa* and *Xfa* in section 9-1.07B(5) with:

04-20-12

total weight of HMA

Add after the variable definitions in section 9-1.07B(9):

04-20-12

The quantity of extender oil is included in the quantity of asphalt.

Replace the headings and paragraphs in section 9-1.11 with:

10-19-12

9-1.11A General

Section 9-1.11 applies if a bid item for time-related overhead is included in the Contract. If a bid item for time-related overhead is included, you must exclude the time-related overhead from every other bid item price.

9-1.11B Payment Quantity

The TRO quantity does not include the number of working days to complete plant establishment work.

For a contract with a TRO lump sum quantity on the Bid Item List, the Department pays you based on the following conversions:

1. LS unit of measure is replaced with WDAY
2. Lump sum quantity is replaced with the number of working days bid
3. Lump sum unit price is replaced with the item total divided by the number of working days bid

9-1.11C Payment Inclusions

Payment for the TRO bid item includes payment for time-related field- and home-office overhead for the time required to complete the work.

The field office overhead includes time-related expenses associated with the normal and recurring construction activities not directly attributed to the work, including:

1. Salaries, benefits, and equipment costs of:
 - 1.1. Project managers
 - 1.2. General superintendents
 - 1.3. Field office managers
 - 1.4. Field office staff assigned to the project
2. Rent
3. Utilities
4. Maintenance
5. Security
6. Supplies
7. Office equipment costs for the project's field office

The home-office overhead includes the fixed general and administrative expenses for operating your business, including:

1. General administration

2. Insurance
3. Personnel and subcontract administration
4. Purchasing
5. Accounting
6. Project engineering and estimating

Payment for the TRO bid item does not include payment for:

1. The home-office overhead expenses specifically related to:
 - 1.1. Your other contracts or other businesses
 - 1.2. Equipment coordination
 - 1.3. Material deliveries
 - 1.4. Consultant and legal fees
2. Non-time-related costs and expenses such as mobilization, licenses, permits, and other charges incurred once during the Contract
3. Additional overhead involved in incentive/disincentive provisions to satisfy an internal milestone or multiple calendar requirements
4. Additional overhead involved in performing additional work that is not a controlling activity
5. Overhead costs incurred by your subcontractors of any tier or suppliers

9-1.11D Payment Schedule

For progress payments, the total work completed for the TRO bid item is the number of working days shown for the pay period on the *Weekly Statement of Working Days*.

For progress payments, the Department pays a unit price equal to the lesser of the following amounts:

1. Price per working day as bid or as converted under section 9-1.11B.
2. 20 percent of the total bid divided by the number of original working days

For a contract without plant establishment work, the Department pays you the balance due of the TRO item total as specified in section 9-1.17B.

For a contract with plant establishment work, the Department pays you the balance due of the TRO item total in the 1st progress payment after all non-plant establishment work is completed.

9-1.11E Payment Adjustments

The 3rd paragraph of section 9-1.17C does not apply.

The Department does not adjust the unit price for an increase or decrease in the TRO quantity except as specified in section 9-1.11E.

Section 9-1.17D(2)(b) does not apply except as specified for the audit report below.

If the TRO bid item quantity exceeds 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B, the Engineer may adjust or you may request an adjustment of the unit price for the excess quantity. For the adjustment, submit an audit report within 60 days of the Engineer's request. The report must be prepared as specified for an audit report for an overhead claim in section 9-1.17D(2)(b).

Within 20 days of the Engineer's request, make your financial records available for an audit by the State for the purpose of verifying the actual rate of TRO described in your audit. The actual rate of TRO described is subject to the Engineer's authorization.

The Department pays the authorized actual rate for TRO in excess of 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B.

The Department pays for 1/2 the cost of the report; the Contractor pays for the other 1/2. The cost is determined under section 9-1.05.

Replace the paragraphs of section 9-1.16D with:

07-19-13

9-1.16D(1) General

Section 9-1.16D applies if a bid item for mobilization is shown on the Bid Item List.

Payments for mobilization made under section 9-1.16D are in addition to the partial payments made under Pub Cont Code § 10261.

Section 9-1.16D(2) applies unless the Contract includes a special provision for section 9-1.16D(1) that specifies section 9-1.16D(3) applies.

11-15-13

9-1.16D(2) Mobilization for Projects Except for Those Over Water Requiring Marine Access

07-19-13

The Department makes partial payments for mobilization under Pub Cont Code § 10264(a) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(a)(5).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(a)(5) in the 1st payment after Contract acceptance.

9-1.16D(3) Mobilization for Projects Over Water Requiring Marine Access

The Department makes partial payments for mobilization under Pub Cont Code § 10264(b) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(b)(6).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(b)(6) in the 1st payment after Contract acceptance.

10-19-12

Delete "revised Contract" in item 1 of the 1st paragraph of section 9-1.16E(2).

Replace "2014" in the 1st paragraph of section 9-1.16F with:

10-19-12

2020

Replace the 2nd paragraph of section 9-1.17C with:

10-19-12

Submit either a written acceptance of the proposed final estimate or a claim statement postmarked or hand delivered before the 31st day after receiving the proposed final estimate.

Add between "the" and "final estimate" in the 1st sentence in the 3rd paragraph of section 9-1.17C:

10-19-12

proposed

Replace the 1st sentence in the 6th paragraph of section 9-1.17D(2)(b) with:

07-19-13

The CPA's audit must be performed as an examination-level engagement under the attestation engagements in the *Government Auditing Standards* published by the Comptroller General of the United States.

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DIVISION II GENERAL CONSTRUCTION

10 GENERAL

04-19-13

Replace the headings and paragraphs in section 10 with:

04-19-13

10-1 GENERAL

10-1.01 GENERAL

Section 10 includes general specifications for general construction work.

10-1.02 WORK SEQUENCING

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

10-1.03 TIME CONSTRAINTS

Reserved

10-1.04 TRAINING AND MEETINGS

Training and meetings are held at times and locations you and the Engineer agree to.

10-1.05-10-1.10 RESERVED

10-2 SUSTAINABLE DESIGN REQUIREMENTS

10-2.01 GENERAL

10-2.01A General

Reserved

10-2.01B-10-2.01H Reserved

10-2.02 CALGREEN TIER 1

10-2.02A-10-2.02H Reserved

10-2.03 LEED

10-2.03A-10-2.03H Reserved

10-3-10-5 RESERVED

10-6 JOB SITE WATER CONTROL

10-6.01 GENERAL

Section 10-6 includes specifications for controlling water to provide a dry working area at the job site.

10-6.02 WATER-FILLED COFFERDAM

Reserved

10-6.03-10-6.10 RESERVED

10-7-10-20 RESERVED

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

11 QUALITY CONTROL AND ASSURANCE

07-19-13

Replace section 11-2 with:

11-2 RESERVED

07-19-13

Replace the table in the 3rd paragraph of section 11-3.01A with:

07-19-13

AWS code	Year of adoption
D1.1	2010
D1.3	2008
D1.4	2011
D1.5	2010
D1.6	2007
D1.8	2009

Replace "does" in the definition of "continuous inspection" in section 11-3.01B with:

07-19-13

do

Replace "gross nonconformance" and its definition in section 11-3.01B with:

07-19-13

gross nonconformance: Rejectable indications are present in more than 20 percent of the tested weld length.

Replace the introductory clause in the 1st paragraph of section 11-3.01C with:

07-19-13

Replace clause 6.1.3 of AWS D1.1, the 1st paragraph of clause 7.1.2 of AWS D1.4, and clause 6.1.2 of AWS D1.5 with:

Replace the 3rd paragraph of section 11-3.01C with:

07-19-13

For each inspection, including fit-up, WPS verification, and final weld inspection, the QC Inspector must confirm and document compliance with the specifications, AWS welding codes, and any referenced drawings.

Replace the paragraphs in section 11-3.01D with:

07-19-13

The Engineer has the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means determined by the Engineer. If welding will be performed without gas shielding, then qualification must also include welding without gas shielding.

Replace clause 6.14.6.1 of AWS D1.1, clause 7.8 of AWS D1.4, and clause 6.1.3.4 of AWS D1.5 with:

Personnel performing NDT must be qualified and certified under American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the written practice of the NDT firm. The written practice of the NDT firm must comply with or exceed the guidelines of the ASNT

Recommended Practice No. SNT-TC-1A. Individuals who perform NDT, review the results, and prepare the written reports must be one of the following:

1. Certified NDT Level II technicians
2. Level III technicians certified to perform the work of Level II technicians

Replace the heading and the 1st through 3rd paragraphs of section 11-3.01E with:

07-19-13

11-3.01E Weld Joint Details

If weld joint details proposed for use in the work are not prequalified under clause 3 of AWS D1.1 or figure 2.4 or 2.5 of AWS D1.5, submit the proposed WPS and the intended weld joint locations.

Upon authorization of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details must weld an additional qualification test plate using the WPS variables and the weld joint detail to be used in production. The test plate must:

1. Have the maximum thickness to be used in production and a minimum length of 18 inches.
2. Be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria must comply with the applicable AWS codes.

If a nonprequalified weld joint configuration is proposed using a combination of WPSs for work welded under AWS D1.1, you may conduct a single test combining the WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 4.5 of AWS D1.1.

Replace the 1st paragraph of section 11-3.01F with:

07-19-13

Replace paragraph 3 of clause 6.26.3.2 of AWS D1.5 with:

3. If indications that exhibit these planar characteristics are present at scanning sensitivity, or other evidence exists to suggest the presence of transverse cracks, a more detailed evaluation of the discontinuity by other means must be performed (e.g., alternate UT techniques, RT, grinding, or gouging for visual inspection or MT of the excavated areas.). For welds that have transverse cracks, excavate the full length of the crack plus 2 inches of weld metal on each side adjacent to the crack and reweld.

Replace "section" in the 2nd paragraph of section 11-3.01F with:

07-19-13

clause

Replace the 1st paragraph of section 11-3.02A with:

07-19-13

Except for stud welding, section 11-3.02 applies to (1) work welded under sections 49, 52, 55, and 75-1.03E and (2) work in section 99 that must comply with an AWS welding code.

Replace the 4th through 6th paragraphs of section 11-3.02C(2) with:

07-19-13

Submit an amended welding QC plan or an addendum to the welding QC plan for any changes to:

1. WPSs
2. NDT firms
3. QC personnel or procedures

4. NDT personnel or procedures
5. Systems for tracking and identifying welds
6. Welding personnel

Allow 15 days for the Engineer's review of an amended welding QC plan or an addendum to the welding QC plan.

Submit 7 copies of each authorized QC plan and any authorized addendums. Make 1 copy available at each location where work is performed.

Replace the 1st paragraph of section 11-3.02C(3) with:

07-19-13

Submit a welding report within 7 days following the performance of any welding. The welding report must include:

1. Daily production log for welding for each day that welding is performed
2. Reports of all visual weld inspections and NDT performed, whether specified, additional, or informational
3. Radiographs and radiographic reports, and other required NDT reports
4. Summary of welding and NDT activities that occurred during the reporting period
5. Reports of each application of heat straightening
6. Summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number
7. Documentation that you have:
 - 7.1. Evaluated all radiographs and radiograph reports and NDT and NDT reports
 - 7.2. Corrected all rejectable deficiencies and that all repaired welds have been reexamined using the required NDT and found acceptable
8. Reports or chart recordings of each application of any stress relieving used
9. Reports and chart recordings for any electroslag welding used

Add between "radiographic" and "envelopes" in the introductory clause in the 3rd paragraph of section 11-3.02C(3):

07-19-13

film

07-19-13

Delete the 3rd sentence in the 5th paragraph of section 11-3.02C(3).

Replace the introductory clause in the 1st paragraph of section 11-3.02D with:

07-19-13

Clauses 6.1.4.1 and 6.1.4.3 of AWS D1.1, the 2nd paragraph of clause 7.1.2 of AWS D1.4, clauses 6.1.3.1 through 6.1.3.3 of AWS D1.5, and clause 7.2.3 of AWS D1.8 are replaced with:

Replace items 1 and 2 in the list in the 2nd paragraph of section 11-3.02D with:

07-19-13

1. Work is welded at a permanent fabrication or manufacturing plant that is certified under the AISC Certification Program for Steel Bridge Fabricators, Intermediate Bridges, and Fracture-Critical Member endorsement if required.
2. Structural steel for building construction work is performed at a permanent fabrication or manufacturing plant that is certified under the AISC Quality Certification Program, Category STD, Standard for Steel Building Structures.

07-19-13

Delete the 3rd paragraph of section 11-3.02D.

Replace the 1st sentence in the 4th paragraph of section 11-3.02D with:

07-19-13

Except for the exempt facilities identified above, an authorized independent third party must witness the qualification tests for welders or welding operators.

Replace the paragraph in section 11-3.02F with:

07-19-13

Welding procedures qualification for work welded under AWS D1.5 must comply with clause 5.12 or 5.12.4 of AWS D1.5 and the following:

1. Unless considered prequalified, qualify fillet welds in each position. Conduct the fillet weld soundness test using the essential variables of the WPS as established by the PQR.
2. For qualifying joints that do not comply with figures 2.4 and 2.5 of AWS D1.5, conduct the test complying with figure 5.3 using the welding parameters that were established for the test conducted complying with figure 5.1.
3. Macroetch tests are required for WPS qualification tests, and acceptance must comply with clause 5.19.3 of AWS D1.5.
4. If a nonstandard weld joint is to be made using a combination of WPSs, you may conduct a test under figure 5.3, combining the qualified or prequalified WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 5.3 of AWS D1.5.
5. Before preparing mechanical test specimens, inspect the PQR welds by visual and radiographic tests. The backing bar must be 3 inches in width and must remain in place during NDT. Results of the visual and radiographic tests must comply with clause 6.26.2 of AWS D1.5 excluding clause 6.26.2.2. All other requirements for clause 5.17 are applicable.

Add to the list in the 3rd paragraph of section 11-3.02G:

07-19-13

3. Repairs not included in the welding QC plan

Replace the 1st sentence of the 4th paragraph of section 11-3.02G with:

07-19-13

Requests to perform 3rd-time excavations, repairs of cracks, or repairs not included in the welding QC plan must include an engineering evaluation.

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12 TEMPORARY TRAFFIC CONTROL

07-19-13

Replace the 1st paragraph of section 12-3.01A(4) with:

10-19-12

Category 2 temporary traffic control devices must be on FHWA's list of acceptable, crashworthy Category 2 hardware for work zones. This list is available on FHWA's Safety Program Web site.

Replace "project" in the 4th paragraph of section 12-3.02C with:

work

10-19-12

Add after "Display" in item 4 in the list in the 2nd paragraph of section 12-3.03B:

or Alternating Diamond

04-19-13

Replace "project" in the 3rd paragraph of section 12-3.07C with:

work

10-19-12

Add to section 12-3:

12-3.18 AUTOMATED WORK ZONE INFORMATION SYSTEM

Reserved

12-3.19–12-3.25 RESERVED

07-19-13

Replace the 7th through 9th paragraphs of section 12-4.02A with:

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

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

Temporary pedestrian facilities must comply with section 12-7.

If an activity requires a closure of a walkway, another walkway must be made available nearby, off of the traveled way.

07-19-13

Delete the 12th paragraph of section 12-4.02A.

07-19-13

Replace section 12-4.03 with:

12-4.03 CLOSURE SCHEDULES AND CONDITIONS

12-4.03A General

Submit closure schedule requests and closure schedule amendments using LCS to show the locations and times of the requested closures.

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st lane closure request. The Department provides the training within 15 days after your request. The training may be web based.

Except for web-based training, the training is held at a time and location you and the Engineer agree to.

For web-based training, the Engineer provides you the website address to access the training.

07-19-13

Within 5 business days after completion of the training, the Department provides LCS accounts and user identifications to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

12-4.03B Closure Schedules

Every Monday by noon, submit a closure schedule request of planned closures for the next week period. The next week period is defined as Sunday noon through the following Sunday noon.

Submit a closure schedule request not less than 25 days and not more than 125 days before the anticipated start of any activity that reduces:

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

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

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

You will be notified through LCS of unauthorized closures or closures that require coordination with other parties as a condition for authorization.

The Engineer may reschedule a closure cancelled due to unsuitable weather.

If a closure is not opened to traffic by the specified time, suspend work. No further closures are allowed until the Engineer has reviewed and authorized a work plan submitted by you that ensures that future closures will be opened to traffic by the specified time. Allow 2 business days for review of your proposed work plan. The Department does not compensate you for your losses due to the suspension of work resulting from the late opening of closures.

Notify the Engineer of delays in your activities caused by:

1. Your closure schedule request being denied although your requested closures are within the specified time frame allowed for closures. The Department does not compensate you for your losses due to amendments to the closure schedule that are not authorized.
2. Your authorized closure being denied.

If you are directed to remove a closure before the time designated in the authorized closure schedule, you will be compensated for the delay.

12-4.03C Contingency Plan

Section 12-4.03C applies if a contingency plan is specified in the special provisions or if a contingency plan is requested.

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

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

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

Based on the Engineer's review, additional materials, equipment, workers, or time to complete activities from that specified in the contingency plan may be required.

Add to section 13-1.01A:

11-15-13

Comply with the Department's general permit issued by the State Water Resources Control Board for Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans). The Department's general permit governs stormwater and nonstormwater discharges from the Department's properties, facilities, and activities. The Department's general permit may be viewed at the Web site for the State Water Resources Control Board, Storm Water Program, Caltrans General Permit.

Add to the list in the 1st paragraph of section 13-1.01D(3)(b):

10-21-11

3. Have completed SWRCB approved QSD training and passed the QSD exam

Add to the list in the 2nd paragraph of section 13-1.01D(3)(b):

10-21-11

3. Have completed SWRCB approved QSP training and passed the QSP exam

Replace "NEL violation" in item 3.6.2 in the list in the 1st paragraph of section 13-1.01D(3)(c) with:

04-19-13

receiving water monitoring trigger

Replace the 1st paragraph in section 13-2.01B with:

04-19-13

Within 7 days after Contract approval, submit 2 copies of your WPCP for review. Allow 5 business days for review.

After the Engineer authorizes the WPCP, submit an electronic copy and 3 printed copies of the authorized WPCP.

If the RWQCB requires review of the authorized WPCP, the Engineer submits the authorized WPCP to the RWQCB for its review and comment. If the Engineer orders changes to the WPCP based on the RWQCB's comments, amend the WPCP within 3 business days.

Replace the 1st paragraph in section 13-3.01B(2)(a) with:

04-19-13

Within 15 days of Contract approval, submit 3 copies of your SWPPP for review. The Engineer provides comments and specifies the date when the review stopped if revisions are required. Change and resubmit a revised SWPPP within 15 days of receiving the Engineer's comments. The Department's review resumes when a complete SWPPP has been resubmitted.

When the Engineer authorizes the SWPPP, submit an electronic copy and 4 printed copies of the authorized SWPPP.

If the RWQCB requires review of the authorized SWPPP, the Engineer submits the authorized SWPPP to the RWQCB for its review and comment. If the Engineer requests changes to the SWPPP based on the RWQCB's comments, amend the SWPPP within 10 days.

Replace "NELs" in item 3.1 in the 3rd paragraph of section 13-3.01B(2)(a) with:

04-19-13

receiving water monitoring triggers

Replace section 13-3.01B(6)(c) with:

04-19-13

13-3.01B(6)(c) Receiving Water Monitoring Trigger Report

Whenever a receiving water monitoring trigger is exceeded, notify the Engineer and submit a receiving water monitoring trigger report within 48 hours after conclusion of a storm event. The report must include:

1. Field sampling results and inspections, including:
 - 1.1. Analytical methods, reporting units, and detection limits
 - 1.2. Date, location, time of sampling, visual observation and measurements
 - 1.3. Quantity of precipitation from the storm event
2. Description of BMPs and corrective actions

Replace "NEL" in the 6th paragraph of section 13-3.01C(1) with:

04-19-13

receiving water monitoring trigger

Replace section 13-3.01C(3) with:

04-19-13

13-3.01C(3) Receiving Water Monitoring Trigger

For a risk level 3 project, receiving water monitoring triggers must comply with the values shown in the following table:

Receiving Water Monitoring Trigger

Parameter	Test method	Detection limit (min)	Unit	Value
pH	Field test with calibrated portable instrument	0.2	pH	Lower limit = 6.0 Upper limit = 9.0
Turbidity	Field test with calibrated portable instrument	1	NTU	500 NTU max

The storm event daily average for storms up to the 5-year, 24-hour storm must not exceed the receiving water monitoring trigger for turbidity.

The daily average sampling results must not exceed the receiving water monitoring trigger for pH.

04-19-13

Delete "and NELs are violated" in the 3rd paragraph of section 13-3.03C.

Replace "working days" at each occurrence in section 13-3.04 with.

10-19-12

original working days

Delete the 1st sentence in the 2nd paragraph of section 13-4.03C(3).

04-19-13

Add between the 2nd and 3rd paragraphs of section 13-4.03C(3):

Manage stockpiles by implementing water pollution control practices on:

04-19-13

1. Active stockpiles before a forecasted storm event
2. Inactive stockpiles according to the WPCP or SWPPP schedule

Replace the paragraph in section 13-4.04 with:

Not Used

04-20-12

Replace "20-7.02D(6)" in section 13-5.02C with:

20-5.03E

07-19-13

Delete "or stockpile" in the 3rd paragraph of section 13-5.02F.

10-19-12

Replace "20-7.03I(10)" in section 13-5.03C with:

20-5.03E(3)

07-19-13

Replace section 13-5.03F with:

13-5.03F Reserved

04-20-12

Delete "or stockpile" in item 1 in the list in the 1st paragraph of section 13-5.03K.

10-19-12

Delete the 3rd paragraph of section 13-5.03K.

10-19-12

Replace the 2nd sentence in the 1st paragraph of section 13-9.01A with:

You may use any of the following systems for temporary concrete washout:

10-19-12

1. Temporary concrete washout facility
2. Portable temporary concrete washout
3. Temporary concrete washout bin

Replace the 2nd paragraph of section 13-9.01B with:

Retain and submit an informational submittal for records of disposed concrete waste.

10-19-12

15-2.02B(5)(b) Saw Cuts

Saw cut using a diamond blade and make cuts perpendicular to the pavement surface. Saw cutting is not required where concrete pavement is adjacent to asphalt concrete pavement.

Saw cut (1) no more than 2 days before removing pavement and (2) such that traffic will not dislodge any pavement piece or segment. Saw cut perpendicular to the traveled way except you may cut parallel or diagonal to the traveled way when removing the pavement during the same lane closure as the saw cutting.

You may make additional saw cuts within the sawed outline.

Saw cuts must be the full depth of the pavement unless otherwise shown.

Saw cut at longitudinal and transverse joints to remove entire slabs. For partial-slab areas, the Engineer determines the exact saw-cut locations.

15-2.02B(5)(c) Reserved

15-2.02B(6) Reserved

15-2.02B(7) Payment

Reserved

Replace section 15-2.02G with:

15-2.02G Remove Guardrail

07-19-13

Where removing guardrail, remove any concrete anchors and steel foundation tubes.

Replace the 1st paragraph of section 15-2.02K with:

07-19-13

Box culverts, concrete pipes, inlets, headwalls, and endwalls must be completely removed if any portion of these structures is (1) within 3 feet of the grading plane in excavation areas, (2) within 1 foot of original ground in embankment areas, or (3) shown to be removed.

Replace "Metal beam guard railing" in the table in the 2nd paragraph of section 15-2.03A(2)(a) with:

Guardrail

07-19-13

Replace the heading of section 15-2.03B with:

Salvage Guardrail

07-19-13

Replace the heading of section 15-2.04D with:

Reconstruct Guardrail

07-19-13

Replace section 15-2.09D with:

15-2.09D Reserved

07-19-13

Replace the 4th paragraph of section 15-2.10B with:

01-18-13

Instead of using new materials similar in character to those in the existing structure, you may use raising devices to adjust a manhole to grade. Before starting paving work, measure and fabricate raising devices. Raising devices must:

1. Comply with the specifications for section 75 except that galvanizing is not required
2. Have a shape and size that matches the existing frame
3. Be match marked by painting identification numbers on the device and corresponding structure
4. Result in an installation that is equal to or better than the existing one in stability, support, and nonrocking characteristics
5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening

Replace the heading of section 15-2.10D with:

07-19-13

Adjust Guardrail

Replace the paragraphs of section 15-3.01 with:

07-19-13

Section 15-3 includes specifications for removing all or a portion of a concrete facility.

Concrete facilities include curbs, gutters, gutter depressions, sidewalks, driveways, slope paving, island paving, barriers, retaining walls, sound walls, minor structures, aprons, spillways, and dams.

Where broken-concrete slope protection is shown, use removed concrete for the construction of the broken-concrete slope protection.

Instead of disposing of removed concrete by removing it from the job site, you may dispose of it on the job site by one of the following methods:

1. Burying it in embankments at authorized locations. Removed concrete must be broken into pieces that can be readily handled and incorporated into embankments and placed at a depth of at least 3 feet below finished grade and slope lines. Concrete must not be buried in areas where piling is to be placed or within 10 feet of trees, pipelines, poles, buildings or other permanent objects or structures.
2. Placing it at authorized locations. The removed concrete must not present an unsightly appearance from the highway.

Replace the paragraph of section 15-3.02 with:

07-19-13

Not Used

Delete the 5th paragraph of section 15-3.03.

07-19-13

Add to the end of section 15-4.01A(2):

04-19-13

Allow 20 days for review of the bridge removal work plan.

Replace the 1st paragraph of section 15-5.01C(1) with:

10-19-12

Before starting deck rehabilitation activities, complete the removal of any traffic stripes, pavement markings, and pavement markers.

Replace the 2nd and 3rd paragraphs of section 15-5.01C(2) with:

10-19-12

Perform the following activities in the order listed:

1. Abrasive blast the deck surface with steel shot. Perform abrasive blasting after the removal of any unsound concrete and placement of any rapid setting concrete patches.
2. Sweep the deck surface.
3. Blow the deck surface clean using high-pressure air.

Replace the 2nd paragraph of section 15-5.01C(4) with:

10-19-12

Before removing asphalt concrete surfacing, verify the depth of the surfacing at the supports and midspans of each structure (1) in each shoulder, (2) in the traveled way, and (3) at the roadway crown, if a crown is present.

Delete "and concrete expansion dams" in the 3rd paragraph of section 15-5.01C(4).

04-19-13

Replace the 2nd paragraph of section 15-5.03A(2) with:

10-19-12

For a contract with less than 60 original working days, submit certificates of compliance for the filler material and bonding agents.

Replace "51-1.02C" in the 1st paragraph of section 15-5.03B with:

04-19-13

51-1.02F

Replace the 4th paragraph of section 15-5.03B with:

10-19-12

For a contract with less than 60 original working days, alternative materials must be authorized before use.

Add between the 5th and 6th paragraphs of section 15-5.03C:

10-19-12

The final surface finish of the patched concrete surface must comply with section 51-1.03F.

Delete the 4th paragraph of section 15-5.05C.

10-19-12

Replace "51-1.03F(5)" in the 3rd paragraph of section 15-5.06C(1) with:

51-1.01D(4)(b)

07-19-13

Replace "51-1.03E(5)" in the 5th paragraph of section 15-5.06C(1) with:

51-1.03F(5)

10-19-12

Delete the 9th paragraph of section 15-5.06C(1).

10-19-12

Delete the 15th paragraph of section 15-5.06C(1).

04-19-13

Add between the 18th and 19th paragraphs of section 15-5.06C(1):

Texture the polyester concrete surface before gelling occurs by longitudinal tining under 51-1.03F(5)(b)(iii), except do not perform initial texturing.

07-19-13

Replace section 15-5.06C(2) with:

15-5.06C(2) Reserved

04-19-13

Delete the 3rd paragraph of section 15-5.06D.

04-19-13

Replace the 1st paragraph in section 15-5.07B(4) with:

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

10-19-12

Replace section 15-5.09 with:

15-5.09 POLYESTER CONCRETE EXPANSION DAMS

04-19-13

15-5.09A General

Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Reinforcement must comply with section 52.

15-5.09B Materials

Not Used

15-5.09C Construction

For new asphalt concrete overlays, place the asphalt concrete overlay before starting polyester concrete activities. Saw cut and remove asphalt concrete at expansion dam locations.

For existing asphalt concrete overlays, remove expansion dams and asphalt concrete to the limits shown. Removing expansion dams must comply with section 15-4 except a bridge removal work plan is not required.

Where a portion of the asphalt concrete overlay is to remain, saw cut a 2-inch-deep neat line along the edge to remain in place before removing the asphalt concrete. Do not damage the existing surfacing to remain in place.

Prepare the deck surface under section 15-5.01C(2).

You may use a mechanical mixer to mix the polyester concrete for expansion dams. The mixer capacity must not exceed 9 cu ft unless authorized. Initiate the resin and thoroughly blend it immediately before mixing it with the aggregate. Mix the polyester concrete for at least 2 minutes before placing.

The application rate of methacrylate resin must be approximately 100 sq ft/gal.

You may place and finish expansion dams using hand methods.

Protect expansion dams from moisture, traffic, and equipment for at least 4 hours after finishing.

For expansion dams over 6 feet long, install 1/4-inch-wide joint material at 6-foot intervals across the width of the expansion dam. Joint material must be either expanded polyurethane or expanded polyethylene.

15-5.09D Payment

Not Used

Add to section 15-6.01A(3)(a):

Within 5 days of completing annular space grouting at a culvert, submit the grouting records.

07-19-13

Replace "41-1.01" in item 10.3 in the list in the 2nd paragraph of section 15-6.01A(3)(d) with:

41-2

07-19-13

Replace "41-1.02" in 1st paragraph of section 15-6.01B(2) with:

41-2

07-19-13

Replace the heading of section 15-6.04 with:

INVERT PAVING

01-18-13

Replace the 1st paragraph of section 15-6.13A(1) with:

Section 15-6.13 includes specifications for installing machine spiral wound PVC pipeliners directly into the culvert.

07-19-13

Replace the heading of section 15-6.13B with:

Machine Spiral Wound PVC Pipeliners, Grouted

07-19-13

For ground anchor walls, a wall zone is the entire wall unless otherwise specified in the special provisions.

Delete the 2nd sentence in the 4th paragraph of section 19-3.01A(3)(b).

01-20-12

Replace "90" in the paragraph of section 19-3.02G with:

90-1

01-18-13

Add to section 19-3.02:

19-3.02I Filter Fabric

Filter fabric must be Class A.

07-19-13

Replace the heading of section 19-3.03C with:

19-3.03B(4) Cofferdams

04-19-13

Replace the heading of section 19-3.03D with:

19-3.03B(5) Water Control and Foundation Treatment

04-19-13

Replace the 1st paragraph of section 19-3.03E(3) with:

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

01-20-12

Add to the end of section 19-3.03E(3):

If filter fabric is shown behind the lagging:

07-19-13

1. Immediately before placing the filter fabric, remove any loose or extraneous material and sharp objects from the surface to receive the filter fabric.
2. Handle and place the filter fabric under the manufacturer's instructions. Stretch, align, and place the fabric without wrinkling.
3. Stitch the adjacent borders of filter fabric or overlap the adjacent borders by 12 to 18 inches. If stitching the border, use yarn of a contrasting color. Yarn size and composition must be as recommended by the fabric manufacturer. Use 5 to 7 stitches per inch of seam.
4. Repair any damaged filter fabric by placing a piece of filter fabric large enough to cover the damaged area and comply with the overlapping or stitching requirements.

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

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

01-20-12

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

01-20-12

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

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

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

01-20-12

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

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

01-20-12

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

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

01-20-12

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

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

01-18-13

01-20-12

Replace the 2nd sentence in the 7th paragraph of section 19-3.04 with:

01-18-13

Structure excavation more than 0.5 foot from the depth shown is paid for as a work-character change if you request an adjustment or the Engineer orders an adjustment.

Replace "Contract completion time" in the 8th paragraph of section 19-6.03D with:

10-19-12

work completion date

Add to section 19:

01-18-13

19-10-19-20 RESERVED

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

20 LANDSCAPE

11-15-13

Replace the headings and paragraphs in section 20 with:

07-19-13

20-1 GENERAL

20-1.01 GENERAL

20-1.01A Summary

Section 20-1 includes general specifications for performing landscaping.

If an irrigation system is to be installed in an existing planting area to be maintained, check for plant deficiencies under section 20-3.02A(4) before starting irrigation work.

Perform a functional test for each irrigation system under 20-2.01A(4)(d):

1. Before planting the plants
2. After planting the plants
3. Before the start of the plant establishment work

If a plant is to be transplanted or an irrigation component is to be relocated, transplant plant or protect irrigation components before performing other construction activities in the area.

Perform roadside clearing:

1. As required to prepare the job site for construction work
2. Until the start of the plant establishment work or Contract acceptance, whichever comes first

20-1.01B Definitions

Reserved

20-1.01C Submittals

At least 15 days before applying any pesticide, submit a copy of the licensed pest control adviser's recommendation.

At the end of each week, submit a report documenting the application of all pesticides as an informational submittal. Use form *Report of Chemical Spray Operations*.

Before mixing a pesticide, submit a copy of the registered label for the pesticide as an informational submittal. If unable to copy, allow the Engineer to read the label on the container.

20-1.01D Quality Control and Assurance

20-1.01D(1) General

Obtain a recommendation from a licensed pest control adviser for the use of all pesticides under the Food & Agri Code. The recommendation must include the pesticides to be used, rates of application, methods of application, and application areas.

The pesticide applicator must have an active and valid qualified applicator license or certificate from the Department of Pesticide Regulation.

20-1.01D(2) Progress Inspections

The Engineer will perform progress inspections before:

1. Cultivating work starts
2. Pressure testing of irrigation pipe on the supply side of control valves
3. Testing of low voltage conductors
4. Planting work starts
5. Completion of planting work

Notify the Engineer at least 4 business days before each inspection is required. Allow at least 3 business days for the Engineer's inspection.

Unless otherwise authorized, do not proceed with the next construction activity until the inspection has been completed and any required corrective work has been performed and authorized.

20-1.02 MATERIALS

20-1.02A General

Reserved

20-1.02B Water

Water available from an existing Department-owned facility within the project limits or an irrigation system to be installed under the Contract is furnished at no charge.

If water is not available, make arrangements for supplying water. Water must be of a quality that will promote plant growth.

20-1.02C Pesticides

Pesticides must comply with the Department of Pesticide Regulation.

Insecticide must be imidacloprid.

Rodenticides must be brodifacoum, bromadiolone, or diphacinone.

Do not use oil or pelleted forms of pesticides for weed control.

For weed control, use a pesticide with a photosensitive dye that produces a contrasting color when sprayed on the ground. The color must disappear between 2 to 3 days after being applied. The dye must not stain surfaces or injure plants or wildlife when applied at the manufacturer's recommended application rate.

20-1.03 CONSTRUCTION

20-1.03A General

Take precautions to prevent irrigation water from:

1. Wetting vehicles, pedestrians, and pavement
2. Eroding soil

Dispose of removed, pruned, and damaged vegetative material.

You may reduce removed vegetative material to chips with a maximum thickness of 1/2 inch and spread within the job site at locations determined by the Engineer. Chipped material must not be substituted for wood mulch, nor must the chipped material be placed within areas to receive wood mulch.

20-1.03B Pesticides

Notify the Engineer of pesticide application times at least 24 hours before each application.

Mix and apply pesticides under the requirements of the Department of Pesticide Regulation and the instructions on the pesticide product label.

Do not apply pesticides:

1. On Saturdays and holidays unless authorized
2. Whenever weather and wind conditions are unsuitable for application
3. Within the plant basin
4. On the foliage and woody parts of the plant

If a granular preemergent is used, it must be covered with mulch on the same work day. Do not apply granular preemergent in plant basins.

Do not apply preemergents:

1. To groundcover plants before the plants have been planted a minimum of 3 days and have been thoroughly watered
2. Within 18 inches of trees, shrubs, and seeded areas

20-1.03C Roadside Clearing

20-1.03C(1) General

Perform roadside clearing by:

1. Removing and disposing of trash and debris
2. Controlling the following pests:
 - 2.1. Rodents
 - 2.2. Insects
 - 2.3. Weeds
3. Removing existing plants as described

Control rodents by using rodenticides or traps.

20-1.03C(2) Remove Existing Plants

Remove existing plants as described. Removal of existing plants includes removing their stumps and roots 2 inches or larger in diameter to a minimum depth of 12 inches below finished grade. Backfill holes resulting from stump removal to finished grade with material obtained from adjacent areas.

If a plant is to be planted within existing groundcover area, remove existing groundcover from within an area 6 feet in diameter centered at each plant location.

20-1.03C(3) Weed Control

Control weeds by the use of pesticides, hand pulling, or mowing.

If pesticides are used to control weeds, apply pesticides before the weeds reach the seed stage of growth or exceed 4 inches in length, whichever occurs first. Do not use pesticides at cutting plant locations.

Where cuttings are to be planted, control weeds by hand pulling within an area 2 feet in diameter centered at each plant location.

If weeds are to be controlled by hand pulling, hand pull weeds before they reach the seed stage of growth or exceed 4 inches in length, whichever occurs first.

Where liner, plug, or seedling plants are to be planted 10 feet or more apart, control weeds by the use of pesticides or hand pulling within an area 2 feet in diameter centered at each plant location. Where liner, plug, or seedling plants are to be planted less than 10 feet apart, control weeds by the use of pesticides within the entire area.

Control weeds by mowing outside of mulched areas, plant basins, groundcover areas, and within areas to be seeded. Mowing must extend to the edges of pavement, dikes, curbs, sidewalks, walls, and fences.

If mowing is to be performed within areas to be seeded, perform mowing as needed until the start of the seeding operation specified in section 21.

Mowing must be performed before the weeds reach the seed stage of growth or exceed 6 inches in length, whichever occurs first. Mow weeds to a height of 3 inches.

20-1.03C(4) Disposal of Removed Groundcover, Weeds, and Mowed Material

Dispose of hand pulled weeds the same day they are pulled. Dispose of removed groundcover within 3 days.

Dispose of mowed material from the initial mowing. Disposal of material from subsequent mowing is not required.

20-1.03D Cultivation

Cultivation must be by mechanical methods and performed until the soil is in a loose condition to a minimum depth of 6 inches. Soil clods must not be larger than 2 inches in maximum dimension after cultivation.

The areas to be cultivated must extend 12 inches beyond the outer limit of each planting area requiring cultivation.

After initial cultivation, place soil amendment and fertilizer at specified rates.

Recultivate to thoroughly mix native soil and amendments.

Do not drive on cultivated areas after cultivation.

Planting areas that have been cultivated and become compacted must be recultivated.

Rocks and debris encountered during soil preparation in planting areas must be brought to the surface of the ground.

Remove rocks and debris as ordered. This work is change order work.

20-1.03E Weed Germination

Reserved

20-1.04 PAYMENT

Items paid for by area are measured parallel to the ground surface.

Planting areas that do not require cultivation but are within the cultivation areas will not be deducted.

20-2 IRRIGATION

20-2.01 GENERAL

20-2.01A General

20-2.01A(1) Summary

Section 20-2 includes specifications for installing irrigation systems.

The irrigation systems shown are diagrammatic.

20-2.01A(2) Definitions

Reserved

20-2.01A(3) Submittals

20-2.01A(3)(a) General

Submit shop drawings for the electrical components of the irrigation system except electrical service 30 days before installation. The drawings must:

1. Include schematic wiring diagrams showing wire sizes and routes between electrical components
2. Show conduit sizes
3. Bear the written approval of the controller manufacturer or the manufacturer's authorized agent
4. Be accompanied by:
 - 4.1. Colored wire and splice samples
 - 4.2. Manufacturer's descriptive and technical literature

After the work shown on the drawing is complete, submit 3 copies of the as-built shop drawings including any wire modifications for each controller installed.

For each controller, laminate and place in an envelope 1 copy of:

1. As-built schematic wiring diagram including wiring modifications
2. 11 by 17 inches as-built irrigation plan

The laminate must be clear, mat-finished plastic that is at least 10 mils thick. The envelope must be heavy-duty plastic.

Attach the envelope to the inside of the controller enclosure or cabinet door. If the door is not large enough to secure the envelope, submit the envelope and its contents.

20-2.01A(3)(b) Manufacturer's Instructions

Submit as an informational submittal the manufacturer's installation instructions 15 days before installing:

1. Couplings for conduits used for irrigation conduits
2. Plastic pipe and fittings
3. Solvent cement for plastic pipe and flexible hose
4. Sprinklers
5. Flow sensors

20-2.01A(3)(c) Maintenance and Operation Manuals

Before Contract acceptance, submit as an informational submittal a manufacturer's maintenance and operation manual for each type of controller installed.

20-2.01A(4) Quality Control and Assurance**20-2.01A(4)(a) General**

Reserved

20-2.01A(4)(b) Pressure Testing**20-2.01A(4)(b)(i) General**

Perform pressure testing for leakage on irrigation supply lines:

1. In the Engineer's presence
2. On business days between 8 a.m. and 5 p.m. unless authorized
3. Before backfilling supply line trenches
4. With irrigation system gate valves open
5. With open ends of the supply line and fittings plugged or capped

Notify the Engineer at least 48 hours before performing a pressure test.

Choose either Method A or B to test supply lines installed by trenching and backfilling and supply lines that are completely visible after installation.

All other supply lines, including those installed in the ground by methods other than trenching and backfilling must be tested by Method A.

Test irrigation supply line in conduit by Method A with the testing period modified to 0.5 hour and no allowable pressure drop.

20-2.01A(4)(b)(ii) Method A

Method A pressure testing procedures for leakage must comply with the following:

1. Pressure gauge must be calibrated from 0 to 200 psi in 5 psi increments and be accurate to within a tolerance of 2 psi.
2. Supply line must be filled with water and connected to a pressure gauge. Place the pipeline under a pressure of 125 psi. Remove the source of pressure and leave the line under the required pressure.
3. Test the supply line under the required pressure for a period of 1 hour. The pressure gauge must remain in place until each test period is complete.
4. Leaks that develop in the tested portion of the system must be located and repaired after each test period if a drop of more than 5 psi is indicated by the pressure gauge. After the leaks have been repaired, repeat the 1 hour pressure test until the drop in pressure is 5 psi or less.

If a system consists of a new supply line connected to an existing line, the new supply line must be isolated from the existing line and tested.

20-2.01A(4)(b)(iii) Method B

Method B pressure testing procedures for leakage must comply with the following:

1. Before any portion of the supply line on the upstream side of a control valve is backfilled, water must be turned on for that portion of the line and maintained at full pressure from the water source for a period not less than 8 consecutive hours after all air has been expelled from the line. Before any

portion of the supply line on the downstream side of the control valve is backfilled, perform the same test for a period not less than 1 hour.

2. Repair leaks that develop in the tested portion of the system. After the leaks have been repaired, repeat the pressure test until no leaks occur as determined by the Engineer.

20-2.01A(4)(c) Sprinkler Coverage Check

After installation of the sprinklers, check and adjust the entire sprinkler system for proper orientation and uniform coverage.

20-2.01A(4)(d) Irrigation System Functional Tests

The functional tests for each irrigation controller or group of controllers and associated irrigation system served by a single electric service point must consist of at least 1 complete cycle of operation. The Engineer determines the length of the cycle.

Notify the Engineer at least 10 days before performing each functional test.

20-2.01A(4)(e) Final Irrigation System Check

Perform the final check of the existing and new irrigation system between 20 and 30 days before Contract acceptance. The Engineer determines the length of the cycle.

Remote control valves connected to existing and new irrigation controllers must be checked for automatic operation when the controllers are in automatic mode.

20-2.01B Materials

20-2.01B(1) General

Use minor concrete for replacing removed concrete facilities.

HMA for replacing removed asphalt concrete surfacing and facilities must comply with section 39. You may use minor HMA if authorized.

20-2.01B(2) Garden Valves

Each garden valve must:

1. Be inverted nose type and of brass or bronze construction with female thread inlet
2. Have a replaceable seat washer, rising valve stem within a protective collar, and male thread hose outlet
3. Have a loose key handle

20-2.01B(3) Recycled Water Identification

Irrigation components used for recycled water must be manufactured or painted purple. Recycled water irrigation pipe and tubing must have a permanent label with the wording "CAUTION RECYCLED WATER" every 24 inches in 2 rows spaced approximately 180 degrees apart in the longitudinal direction of the pipe or tubing.

The recycled water warning sign must be a decal or a decal attached to a 1/16-inch thick aluminum plate or tag.

Each warning sign decal must:

1. Show the phrase "Recycled Water, Do Not Drink" and the drinking glass graphic symbol
2. Be UV fade and weather resistant and manufactured from flexible vinyl with or without mylar
3. Have a purple background, black text, and self-adhesive backing

Each warning tag must:

1. Show the phrase "RECYCLED WATER" and the drinking glass graphic symbol
2. Be UV fade and weather resistant
3. Be purple, double-sided, and manufactured from polyurethane
4. Have an integral neck attachment and attachment hole capable of withstanding 178 lb of pull-out resistance
5. Have hot-stamped black lettering

Posts and hardware for warning signs must comply with section 56-4.

Concrete sprinkler protectors used with recycled water must be painted purple.

20-2.01B(4) Location Markers

Location markers must be schedule 40 white PVC plastic pipe.

20-2.01B(5) Pull Boxes

Pull boxes must comply with section 86-2.06 and be no. 5 or larger unless otherwise shown. Pull boxes for low voltage conductors must not have side openings.

Pull box covers used solely for irrigation electrical service must be marked "IRRIGATION".

20-2.01B(6) Unions

Unions must be brass or malleable iron capable of withstanding the maximum required working pressure.

20-2.01B(7) Valve Boxes and Covers

Valve boxes must be precast concrete.

Covers must be:

1. Concrete, steel, or cast iron.
2. Marked "WATER" in cast-in letters not less than 1 inch high.
3. 1 piece, except 2 pieces are required when the weight of the valve box cover exceeds 35 lb.

The valve box covers must include a polyurethane label with the appropriate controller letter and station number as shown.

20-2.01B(8) Wye Strainers

Wye strainers must:

1. Have a cast iron or all bronze body
2. Have a removable stainless steel strainer screen:
 - 2.1. With an open area equal to at least 3 times the cross-sectional area of the pipe based on an iron pipe size
 - 2.2. With 40-mesh woven wire, except:
 - 2.2.1. For a backflow preventer assembly, the screen must be 20-mesh woven wire mesh or perforated sheet with 0.045-inch diameter holes
 - 2.2.2. For a valve assembly, the screen must be 80-mesh woven wire mesh
3. Be capable of withstanding a working pressure of 150 psi
4. Be equipped with a garden valve at the outlet

The wye strainer filter housing must:

1. Withstand a working pressure of 150 psi
2. Be manufactured of reinforced polypropylene plastic

20-2.01C Construction

20-2.01C(1) General

Repair irrigation systems within 24 hours after a malfunction or damage occurs.

Connect underground metallic pipes, valves, or fittings made of dissimilar metals through a dielectric coupling or bushing.

You may install conduits, conductors, and supply lines by methods other than trenching provided that they are not damaged and are installed at the depths specified.

20-2.01C(2) Trenching and Backfilling

Trench and backfill under section 86-2.01.

Remove plants under 20-1.03C as necessary to perform trenching. If plants are to remain, adjust trench alignment to minimize damage.

If removal of:

1. Turf is required, remove to a maximum width of 12 inches.
2. Groundcover is required, remove to a maximum width of 6 feet. Existing *Carpobrotus* and *Delosperma* may be rototilled if the backfill for the trenches does not contain plants longer than 6 inches in length.

Make a 2-inch deep sawcut along neat lines around the perimeter of the pavement to be removed at locations determined by the Engineer.

The trench must have uniform bearing throughout the entire length and must be free of jagged rubble or sharp objects. Ensure conduit, supply line, and joints are not moved or damaged by backfill operations.

For a project with multiple water service points, excavate and backfill trenches for 1 service point at a time.

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Trenches for irrigation supply lines and conduits 3 inches and larger must be 5 times the pipe or conduit diameter deep and 2 times the pipe or conduit diameter wide.

Trenches for irrigation supply lines and conduits 2-1/2 inches or less in diameter must be a minimum of 12 inches below finished grade, measured from the top of the installed pipe.

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Trenches must be at least 4 feet from curbs, dikes, and paved shoulders.

Rocks and debris encountered during trenching operations must be brought to the surface of the ground. Remove rocks and debris as ordered. This work is change order work.

If trenching requires the removal of plants, in areas with:

1. Turf, replace turf with sod under section 20-3.03C(3)(e).
2. Groundcover, replace groundcover plants from flats and plant at 12 inches on center under section 20-3.03C. No replacement of *Carpobrotus* and *Delosperma* is required if removed by rototilling.

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Where existing surfacing is removed, replace the structural section to match the materials removed. Replacement concrete must be of uniform smoothness, color, and texture equal to the adjacent concrete surface. Dispose of removed material. Install supply line and conduits at the bottom of trenches and backfill with sand to a depth of 2 inches over the top of the supply lines and conduits. Excluding the part of the trench backfilled with surfacing or pavement, the remainder of the trench must be backfilled with material that is excavated from the trench. Rock, broken concrete, asphalt concrete and other particles larger than 2 inches in greatest dimension must not be used.

07-19-13

20-2.01C(3) Pull Boxes

Install pull boxes under section 86-2.06 at the following locations:

1. At all conductor splices except splices made in valve boxes
2. Within 5 feet of irrigation controllers
3. At ends of electrical conduits
4. At other locations shown

20-2.01C(4) Valve Boxes and Covers

Install and identify each valve box as shown.

In walkways and paved areas, install the top of the valve box flush with the surrounding finished grade.

20-2.01C(5) Recycled Water Warning Signs

Install recycled water warning signs on irrigation facilities using recycled water.

Install sign decals directly to clean, smooth surfaces. Clean the surface with alcohol or an equivalent cleaner before applying the decal.

Install a 4 by 4 inch warning sign decal to each:

1. Backflow preventer assembly
2. Irrigation controller enclosure cabinet door

Install a 2 by 2 inch warning tag to the each remote control valve and valve box cover.

Install a 2-1/2 by 3 inches sign decal to each sprinkler riser.

Under local regulations, install a 12 by 12 inch warning sign decal on an aluminum plate and attach to gates, fences, and walls located in the vicinity of a recycled water irrigation system. On gates and fences, install signs with S hooks and C clips or 14-gauge galvanized steel wire. On concrete walls or other rough surfaces, install signs with a silicon-based adhesive.

20-2.01C(6) Garden Valves

Furnish 3 keys for each garden valve before Contract acceptance.

20-2.01D Payment

Not Used

20-2.02 EXISTING IRRIGATION FACILITIES

20-2.02A General

20-2.02A(1) Summary

Section 20-2.02 includes specifications for checking, testing, operating, replacing, and relocating existing irrigation facilities.

20-2.02A(2) Definitions

Reserved

20-2.02A(3) Submittals

Submit a list of irrigation system deficiencies within 7 days after checking the existing facilities.

20-2.02A(4) Quality Control and Assurance

After irrigation facilities have been relocated, demonstrate in the presence of the Engineer that the relocated facilities function properly.

Certify each existing backflow preventer under section 20-2.03A(4).

20-2.02B Materials

Valve box covers must be the same size as the covers they replace.

Control and neutral conductors must be the same size and color as the control and neutral conductors they replace.

20-2.02C Construction

20-2.02C(1) General

Notify the Engineer at least 4 business days before shutting off the water supply to any portion of the existing irrigation system and immediately after restoring the water supply to any portion of the existing irrigation system.

If an irrigation facility to be relocated is determined unsuitable by the Engineer, replace irrigation facility under section 20-2. This work is change order work.

20-2.02C(2) Check and Test Existing Irrigation Facilities

Before performing irrigation system work, check existing irrigation facilities to remain in place or to be relocated. The Engineer determines the test watering cycle lengths. Check for deficiencies including missing parts, damaged components, and improper operation. Correct deficiencies as ordered. The correction of deficiencies is change order work.

20-2.02C(3) Operate Existing Irrigation Facilities

If the Contract includes a bid item for operate existing irrigation facilities, after performing work under section 20-2.02C(2), operate existing irrigation facilities through Contract acceptance.

Operate existing irrigation facilities except for water meters, underground supply lines, control and neutral conductors, and electrical conduits.

Check for proper operation at least once every 30 days. Adjust, repair, or replace existing irrigation facilities within 7 days of finding any deficiency.

Operate irrigation systems using the automatic irrigation controller until Contract acceptance. You may operate irrigation controllers manually during plant replacement, fertilization, weed germination, and repair work.

Program the irrigation controllers for seasonal requirements.

20-2.02C(4) Replace Valve Box Covers

Existing valve box covers shown to be replaced must remain in place until the new covers are ready to be installed.

Dispose of removed valve box covers.

20-2.02C(5) Relocate Backflow Preventer Assemblies

Relocate backflow preventer assembly as shown and install under section 20-2.03C.

20-2.02C(6) Relocate Water Meters

Relocate water meter as shown.

20-2.02C(7) Relocate Irrigation Controllers

Relocate irrigation controller as shown and install under section 20-2.07C.

20-2.02D Payment

Not Used

20-2.03 BACKFLOW PREVENTER ASSEMBLIES

20-2.03A General

20-2.03A(1) Summary

Section 20-2.03 includes specifications for installing a backflow preventer assembly.

20-2.03A(2) Definitions

Reserved

20-2.03A(3) Submittals

Reserved

20-2.03A(4) Quality Control and Assurance

Each backflow preventer assembly must be certified by a backflow preventer tester. The tester must have an active and valid certification from the water purveyor having jurisdiction.

If the local water purveyor does not have a certification program, the tester must be certified by AWWA or a nearby county with a certification program.

Notify the Engineer at least 5 business days before certifying backflow preventer assembly.

Certify each backflow preventer assembly annually and within 10 days before Contract acceptance.

20-2.03B Materials

20-2.03B(1) General

Each backflow preventer assembly must include:

1. Backflow preventer including gate valve, wye strainer, brass or malleable iron unions, fittings, and supports
2. Blanket
3. Enclosure
4. Concrete pad

Concrete for the pad must be minor concrete, except the concrete must not contain less than 463 pounds of cementitious material per cubic yard. Hand mixing of the concrete is allowed.

20-2.03B(2) Backflow Preventers

Each backflow preventer must:

1. Be reduced-pressure principle type.
2. Comply with the requirements of the water purveyor that has jurisdiction.
3. Be factory-assembled with:
 - 3.1. 2 check valves
 - 3.2. 1 pressure differential relief valve
 - 3.3. 4 test cocks
 - 3.4. 2 shut-off valves manufactured from iron or bronze. Shut-off valves must be one of the following:
 - 3.4.1. Resilient wedge gate valves
 - 3.4.2. Resilient seated and fully ported ball valves
 - 3.4.3. Resilient seated butterfly valves

Backflow preventer components must be capable of withstanding a working pressure of 150 psi.

20-2.03B(3) Backflow Preventer Blankets

Each backflow preventer blanket must:

1. Be polyester fabric coated with vinyl or polymeric resin
2. Be resistant to UV light, water, mildew, and fire
3. Have an R-value from R-30 to R-38

Blankets must have a securing mechanism that includes either zippers, hook-pile tape, grommets, snaps, buttons, or any combination of these. Wherever the backflow preventer is not in an enclosure, the securing mechanism must be capable of accepting a padlock.

20-2.03B(4) Backflow Preventer Enclosures

Each backflow preventer enclosure must:

1. Have expanded metal sides, ends, and top panels fabricated from 9-gauge minimum thickness stainless sheet steel with openings of approximately 3/4 by 1-3/4 inches
2. Have expanded metal panels attached to the 3/16-inch thick steel frame by a series of welds not less than 1/4 inch in length and spaced not more than 4 inches on center, along the edges of the enclosure
3. Have Type 304 stainless steel lock guards with a minimum thickness of 12 gauge.
4. Have hexagonal nuts and lock-type washers
5. Be powder coated by the manufacturer to match color no. 20450 of FED-STD-595.
6. Have padlock clasp or latch and lock mechanism

20-2.03C Construction

Finish exposed top surfaces of concrete pad with a medium broom finish applied parallel to the long dimension of pads.

Install hold-downs for the backflow preventer assembly enclosure when concrete is still plastic.

20-2.03D Payment

Not Used

20-2.04 CAM COUPLER ASSEMBLIES

20-2.04A General

Section 20-2.04 includes specifications for installing a cam coupler assembly.

20-2.04B Materials

Each cam coupler assembly must consist of a cam coupler, dust cap, check valve, pipes, fittings, concrete thrust block, and valve box with woven wire cloth and gravel.

Cam couplers and keys must be manufactured of brass or bronze and be able to withstand a working pressure of 150 psi.

Furnish 3 loose cam coupler keys before Contract acceptance.

20-2.04C Construction

Install cam coupler assemblies in valve boxes as shown.

20-2.04D Payment

Not Used

20-2.05 CONTROL AND NEUTRAL CONDUCTORS

20-2.05A General

20-2.05A(1) Summary

Section 20-2.05 includes specifications for installing control and neutral conductors.

20-2.05A(2) Definitions

Reserved

20-2.05A(3) Submittals

Reserved

20-2.05A(4) Quality Control and Assurance

Perform field tests on control and neutral conductors. Field tests must comply with the specifications for lighting circuits in section 86-2.14B.

Where the conductors are installed by trenching and backfilling, perform field tests after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

20-2.05B Materials

Control and neutral conductors must comply with the requirements in section 86-2.08.

For connections between 24-volt irrigation controllers and valve solenoids, use control and neutral conductors. Conductors must include a control conductor for each valve and a common neutral.

Conductor insulation color, except for the stripes, must be continuous throughout. The color of the conductors must be consistent from the controller to each valve. Neutral conductors must be white. Do not use white for control conductors. Do not use conductors with green insulation except as permitted by the NEC.

Conductors must be:

1. No. 12 AWG or larger or no. 14 AWG or larger for armor-clad
2. Rated for 36 V or 600 V for armor-clad
3. Rated for direct burial
4. Underground feeder cable Type UF and TWU
5. Solid, uncoated copper for armor-clad
6. Not less than 90 percent of the AWG diameter required

No. 10 and smaller conductors must be insulated with a minimum of 56 mils of PVC or a minimum of 41 mils of polyethylene. No. 8 and larger conductors must be insulated with a minimum of 70 mils of PVC.

No. 10 and smaller armor-clad conductors must be insulated with a minimum of 41 mils of polyethylene. No. 8 and larger armor-clad conductors must be insulated with 54 to 60 mils of PVC.

Armor-clad conductors must include:

1. Stainless steel tape armor, Type 304 and helically wrapped with a 33 percent minimum overlap. The tape must be 0.5 inch wide and at least 0.005 inch thick.
2. PVC outer conductor jacket that is UV resistant and complies with the ICEA S-61-402, NEMA standard WC5 and UL listing 1263. The jacket nominal thickness must be 24 to 30 mils thick.

20-2.05C Construction

20-2.05C(1) General

Reserved

20-2.05C(2) In Open Trenches

Do not install control and neutral conductors above each other in an open trench. Wrap conductors together with electrical tape at 5 foot intervals.

Where conductors are installed in the same trench as supply line, install at the same depth as the line. At other locations, install conductors not less than 12 inches below finished grade.

Where conductors are not in a supply line trench, install conductors at least 4 feet from curbs, dikes, and paved shoulders.

20-2.05C(3) In Conduits

Install conductors in electrical conduit if conductors are to be:

1. Surface mounted
2. Installed in or on structures
3. Installed under paved areas
4. Installed in irrigation conduits
5. Placed in concrete

20-2.05C(4) Splicing

Splice low voltage control and neutral conductors under sections 86-2.09C, 86-2.09D, and 86-2.09E, except do not use method B. Tape used for splice insulation must be PVC tape.

Leave at least 2 feet of slack for each conductor at each:

1. Pull box
2. Valve box for each conductor that is connected to other facilities within the box or spliced within the box

Do not splice conductors in irrigation controller cabinets.

Permanent splice connections must be made with freshly cut and skinned conductors. Do not use temporary splices made for testing valve circuits as permanent splices.

20-2.05C(5) Marking

Mark control and neutral conductors in pull boxes, valve boxes, at irrigation control terminals, and at splices.

Mark conductor terminations and splices with adhesive cloth wrap-around markers. Seal markers with clear, heat-shrinkable sleeves.

Mark nonspliced conductors with clip-on C-shaped white extruded PVC sleeves. Sleeves must have black indented legends of uniform depth with transparent overlays over the legends and chevron cuts for the alignment of 2 or more sleeves.

Identify markers for the control conductors with the appropriate irrigation controller and station number.

20-2.05D Payment

Not Used

20-2.06 FLOW SENSORS

20-2.06A General

Section 20-2.06 includes specifications for installing a flow sensor.

20-2.06B Materials

Each flow sensor must be an inline type with a nonmagnetic spinning impeller as the only moving part.

The electronics housing must:

1. Be schedule 80 PVC or cast 85-5-5-5 bronze
2. Include glass-filled polyphenylene sulfide
3. Be easily removable from the meter body and include 2 ethylene-propylene O-rings

The impeller must be tungsten carbide.

The electronics must be rated to withstand prolonged water immersion conditions and include 2 single conductor 18 AWG leads, 48 inches long.

The insulation must be direct burial UF type colored red for the positive lead and black for the negative lead.

The flow sensor must be capable of withstanding:

1. 100 to 400 psi operating pressure depending on sensor size shown
2. Liquid temperatures up to 220 degrees F
3. Flows from 1/2 to 15 ft/sec

20-2.06C Construction

Install flow sensor as shown.

20-2.06D Payment

Not Used

20-2.07 IRRIGATION CONTROLLERS

20-2.07A General

20-2.07A(1) Summary

Section 20-2.07 includes specifications for installing irrigation controllers.

20-2.07A(2) Definitions

irrigation controller: "Smart" irrigation controller as defined by the Irrigation Association.

remote irrigation control system (RICS): Centralized water management system that consists of a base station, centralized server, satellite controllers.

base station: Designated computer located at a Department maintenance facility or District Office that collects data from a series of satellite controllers through a centralized server.

centralized server: Designated server or web-based application that collects data from all base stations.

web-based application: Encrypted managing software that is coded in a browser-supported language and is executable via a common internet web browser (e.g., Microsoft Internet Explorer, Firefox, Safari, etc.).

satellite controller: Irrigation controller that communicates directly to a base station or centralized server.

network communication: Identified means through which satellite controllers, base stations, and a centralized server communicate to one another (i.e., fiber optics, spread spectrum, phone line, etc.).

remote access device: Device (i.e., FCC compliant radio remote, cell phone or wireless, etc.) used to communicate with satellite controllers from a remote location.

20-2.07A(3) Submittals

Submit as an informational submittal, a complete manufacturer's maintenance and operations manual for each type of controller installed. Submit the manual at the time the wiring plans and diagrams are placed inside the controller enclosure or cabinet door.

20-2.07A(4) Quality Control and Assurance

Provide training by a qualified person on the use and adjustment of the irrigation controllers installed 30 days before Contract acceptance.

Modifications to electrical components must be done by the manufacturer before shipment to the job site.

The installation date and expiration date of the manufacturer's guarantee for the controllers must be permanently marked on the inside face of the controller.

20-2.07B Materials

20-2.07B(1) General

Conventional A/C powered irrigation controllers must operate on 110/120 V, 60 Hz(ac) and supply 24 to 30 VAC, 60 Hz(ac) for operating electrical remote control valves.

Concrete for the pad and foundation must be minor concrete, except the concrete must not contain less than 463 pounds of cementitious material per cubic yard. Hand mixing of the concrete is allowed.

20-2.07B(2) Irrigation Controllers

20-2.07B(2)(a) General

The irrigation controllers must:

1. Be A/C, battery, solar, or 2-wire as shown
2. Be from a single manufacturer.
3. Be fully automatic and capable of operating a complete 30-day or longer irrigation program.
4. Have a switch or button on the face of the irrigation control panel showing that the irrigation controller can be turned on or off and provide for automatic or manual operation. Manual operation must allow cycle start at the desired station and allow for the minimum activation of a single station or have the option to operate multiple stations in sequential or simultaneous operation modes.
5. Have non-volatile memory.
6. Have a watering time display on the face of the control panel.
7. Have a panel and circuit board connected to the low voltage control and neutral conductors by means of a plug and receptacle connectors located within the cabinet enclosure.
8. Have a variable or incremental timing adjustment ranging from 1 minute to 360 minutes per station.
9. Be capable of operating at least 3 program schedules.
10. Be capable of having at least 4 start times per program schedule.
11. Have an output that can energize a pump start circuit or a remote control master valve.
12. Be protected by fuses and circuit breakers.
13. Display a program and station affected by a sensory alert without altering other watering schedules not affected by the alert.
14. Be capable of global manual and automatic seasonal adjustments to all valves in any given program.
15. Automatically alter watering schedule in accordance with evapotranspiration data provided by a local weather station or have an internal programmed default of historical evapotranspirational data for a given region.
16. Support a flow sensor, rain sensor, or weather station and have automatic shut-off capability.
17. Be capable of communicating with the remote access device.

If the irrigation controller is installed in an enclosure cabinet, the cabinet must be stainless steel and must comply with section 86-3.04A.

Irrigation controllers not installed in enclosure cabinets must be weatherproof, constructed of fiberglass or metal and have a door lock with 2 keys provided.

RICS must meet the requirements of an irrigation controller and be capable of being accessible only through a secured and encrypted server that is password and firewall protected by the Department or be accessible through a firewall secure remote server that is independent from any Department servers. The Department will set up and manage the network communication.

20-2.07B(2)(b) Battery Powered Irrigation Controllers

Reserved

20-2.07B(2)(c) Solar Powered Irrigation Controllers

Reserved

20-2.07B(2)(d) Two-wire Irrigation Controllers

Reserved

20-2.07B(3) Irrigation Controller Enclosure Cabinets

The irrigation controller enclosure cabinet must:

1. Be stainless steel.
2. Include a mounting panel. Fabricate mounting panels with one of the following:
 - 2.1. 3/4-inch exterior AC grade veneer plywood. Paint panels with 1 application of an exterior, latex based, wood primer and 2 applications of an exterior, vinyl acrylic enamel, white in color. Paint panels on all sides and edges before installation of the panels in the cabinets and the equipment on the panels.
 - 2.2. 3/16-inch thick aluminum sheets.
 - 2.3. 10-gauge cold-rolled steel sheets.
 - 2.4. 0.157-inch stainless steel metal sheets.
3. Provide cross ventilation, roof ventilation, or a combination of both. Ventilation must not compromise the weather resistance properties of the cabinet and must be fabricated by the cabinet manufacturer.
4. Include protection against lightning damage.
5. Have an area inside the cabinet doors for storage of the as-built schematic wiring diagram and irrigation plans.
6. Have padlock clasp or latch and lock mechanism.

20-2.07B(4) Rain Sensors

A rain sensor unit must be a solid state, automatic shut-off type, and compatible with the irrigation controller. The rain sensor unit must automatically interrupt the master remote control valves when approximately 1/8 inch of rain has fallen. The irrigation controller must automatically be enabled again when the accumulated rainfall evaporates from the rain sensor unit collection cup.

Rain sensor units must be one of the following:

1. Rated 24 V(ac) to 30 V(ac)
2. Wireless and FCC compliant

20-2.07C Construction

Finish exposed top surface of concrete pad with a medium broom finish applied parallel to the long dimension.

Locate irrigation controllers in pedestal or wall mounted enclosures as shown.

Install electrical components for automatic irrigation systems under section 86-1.02.

Install irrigation controllers under the manufacturer's instructions and as shown.

If 2 or more irrigation controllers operate the same remote master control valve, furnish and install an isolation relay under the controller manufacturer's instructions.

Where direct burial conductors are to be connected to the terminal strip, connect the conductors with the open-end-crimp-on wire terminals. Exposed wire must not extend beyond the crimp of the terminal and the wires must be parallel on the terminal strip.

Install rain sensor units for irrigation controllers on the irrigation controller enclosure cabinets. Provide protection against lightning damage.

20-2.07D Payment

Payment for electrical service for 120-volt or higher is not included in the payment for irrigation controller.

20-2.08 IRRIGATION CONDUIT

20-2.08A General

20-2.08A(1) Summary

Section 20-2.08 includes specifications for installing irrigation conduit under a roadway or other facility to accommodate electrical conduit for control and neutral conductors and irrigation supply lines.

Before performing work on irrigation systems, locate existing conduits shown to be incorporated into the new work.

Before removing or disturbing existing Type A pavement markers that show the location of the existing conduit, mark the location of the existing conduit on the pavement.

20-2.08A(2) Definitions

Reserved

20-2.08A(3) Submittals

Reserved

20-2.08A(4) Quality Control and Assurance

Demonstrate the conduits are free of obstructions after placement of base and surfacing.

Before and after extending the irrigation supply line in a conduit, pressure test the supply line under section 20-2.01A(4)(b).

After conductors are installed in a conduit, test the conductors under section 20-2.05A(4).

Assign a technical representative to direct and control the directional bore activities. The representative must be present during directional bore activities. Unless otherwise authorized, perform directional bore activities in the presence of the Engineer.

20-2.08B Materials

20-2.08B(1) General

Reserved

20-2.08B(2) ABS Composite Pipe Conduit

ABS composite pipe and couplings must comply with ASTM D 2680. Couplings must be solvent cement type.

20-2.08B(3) Corrugated High Density Polyethylene Pipe Conduit

Corrugated high density polyethylene pipe must comply with ASTM F 405 and F 667 or be Type S and comply with AASHTO M252 and M294. Couplings and fittings must be as recommended by the pipe manufacturer.

20-2.08B(4) Corrugated Steel Pipe Conduit

Corrugated steel pipe conduit must comply with section 66. The nominal thickness of metal sheets for pipe must be 0.064 inch for corrugated steel pipe and 0.060 inch for corrugated aluminum pipe. Coupling bands and hardware must comply with section 66.

20-2.08B(5) Polyvinyl Chloride Pipe Conduit

PVC pipe conduit must be schedule 40 and comply with ASTM D 1785.

Fittings must be schedule 80.

20-2.08B(6) Welded Steel Pipe Conduit

Welded steel pipe must comply with ASTM A 53. Pipe must be black and have either welded or threaded joints.

The minimum wall thickness for the various sizes of welded steel pipe must comply with the dimensions shown in the following table:

Pipe size, nominal (inch)	Minimum wall thickness (inch)
3	0.216
4	0.237
6	0.280
8	0.277
10	0.279
12	0.330

20-2.08C Construction**20-2.08C(1) General**

When existing conduits are to be incorporated in new work, excavate exploratory holes for locating existing conduits at the locations indicated by existing markers or as directed. Excavate and backfill exploratory holes to a maximum size of 2-1/2 feet in width, 5 feet in depth, and 5 feet on each side of the marker or directed location parallel to the roadway. If the conduit is not found and if ordered, increase the size of the exploratory holes beyond the dimensions specified. The additional excavation and backfill is change order work.

If extending an existing conduit, remove conductors from the conduit.

Use a coupling band if the new conduit matches the existing conduit diameter, otherwise overlap the conduit at least 12 inches.

After extending existing conduits, install conductors that match the color and size of the existing conductors without splices. Splice conductors in adjacent pull boxes.

If installing a control and neutral conductor and electrical conduit through the irrigation conduit, install a no. 5 pull box at each end.

Remove debris found in the conduit before performing other work. Debris found more than 3 feet from the ends of the conduits is removed as change order work.

Extend conduit 2 feet beyond all paving unless otherwise shown.

Cap the ends of unused conduit.

Designate the location of each conduit by cementing a Type A pavement marker as shown. Type A pavement markers and adhesive must comply with section 85.

20-2.08C(2) Welded Steel Pipe Conduit**20-2.08C(2)(a) General**

Install welded steel pipe by directional boring or jack and drill.

Install top of conduits:

1. 18 to 30 inches below the finished surface in sidewalk areas
2. 40 to 52 inches below the finished grade in other paved areas

20-2.08C(2)(b) Directional Boring

Notify the Engineer 2 business days before starting directional bore activities.

The diameter of the boring tool for directional boring must be only as large as necessary to install the conduit.

Mineral slurry or wetting solution may be used to lubricate the boring tool and to stabilize the soil surrounding the boring path. The mineral slurry or wetting solution must be water based.

The directional bore equipment must have directional control of the boring tool and have an electronic boring tool location detection system. During operation, the directional bore equipment must be able to determine the location of the tool both horizontally and vertically.

20-2.08C(2)(c) Jack and Drill

Notify the Engineer 2 business days before starting jack and drill activities.

Jacking or drilling pits must be no closer than 2 feet from pavement edge whenever possible.

If authorized, small holes may be cut in the pavement to locate or remove obstructions.

Do not use excessive water that will soften subgrade or undermine pavement.

20-2.08C(3) Schedule 40 Pipe Conduit

Where schedule 40 pipe conduit 2 inches or less in outside diameter is installed under surfacing, you may install by directional boring under section 20-2.08C(2)(b).

For conduit 2 inches or less in diameter, the top of the conduit must be a minimum of 18 inches below surfacing.

Extend schedule 40 pipe conduit 6 inches beyond surfacing. Cap ends of conduit until used.

20-2.08D Payment

Schedule 40 PVC pipe conduit is paid for as plastic pipe (schedule 40) (supply line).

20-2.09 IRRIGATION SUPPLY LINE

20-2.09A General

20-2.09A(1) Summary

Section 20-2.09 includes specifications for installing irrigation supply line.

If the supply line location interferes with the excavation of plant holes, relocate the plant hole to clear the supply line. Do not install supply lines through plant holes unless shown.

Supply lines, control and neutral conductors and electrical conduits installed in common trenches must not be installed above each other.

20-2.09A(2) Definitions

Reserved

20-2.09A(3) Submittals

Submit a certificate of compliance for polyethylene pipe and plastic pipe supply line.

20-2.09A(4) Quality Control and Assurance

Solvent cement must comply with the local Air Quality Management District requirements.

20-2.09B Materials

20-2.09B(1) General

Irrigation supply pipe must be metal or plastic as shown.

PCC for thrust blocks must be produced from commercial-quality aggregates. The concrete must contain at least 295 pounds of cementitious material per cubic yard.

20-2.09B(2) Copper Pipe Supply Line

Copper pipe must be Type K rigid pipe and comply with ASTM B 88. Fittings must be wrought copper or cast bronze either soldered or threaded.

Solder must be 95 percent tin and 5 percent antimony.

20-2.09B(3) Galvanized Steel Pipe Supply Line

Galvanized steel pipe supply line and couplings must be standard weight and comply with ASTM A 53, except that the zinc coating must not be less than 90 percent of the specified amount. Except for couplings, fittings must be galvanized malleable iron, banded and threaded, and comply with ANSI B16.3, Class 150.

Joint compound must be nonhardening and noncorrosive. Do not use pipe thread sealant tape.

20-2.09B(4) Drip Irrigation Tubing

Drip irrigation tubing must be virgin polyethylene plastic and comply with ASTM D 2737.

The drip irrigation tubing must be distribution tubing with preinstalled in-line emitters.

If preinstalled in-line drip irrigation tubing is not shown, you may install emitters that match the distribution requirements shown. The emitters must be barbed or threaded-type outlet devices with dual silicone diaphragms and installed under the manufacturer's instructions.

The emitters must meet the flow rate and operating pressure range shown.

The wall thickness of polyethylene tubing must comply with the following requirements when tested under ASTM D 2122:

Pipe size, nominal (inch)	Minimum wall thickness (inch)	Maximum wall thickness (inch)
1/2	0.050	0.070
5/8	0.055	0.075
3/4	0.060	0.080

The polyethylene tubing fittings must be leak-free, compression type and have female sockets with an internal barb to provide a positive pipe-to-fitting connection that will not separate at the designed pressure.

20-2.09B(5) Plastic Pipe Supply Line

Plastic pipe supply line must be PVC pipe that is NSF approved.

Schedule 40 plastic pipe supply line must comply with ASTM D 1785.

Class 315 plastic pipe supply line must comply with ASTM D 2241.

PVC gasketed bell joints must comply with ASTM D 2672, ASTM D2241, ASTM D 3139, and ASTM F 477.

For solvent-cemented type joints, the primer and solvent cement must be made by the same manufacturer. The primer color must contrast with the color of the pipe and fittings.

Solvent-cemented fittings must be injection molded PVC, schedule 40, and comply with ASTM D 2466.

Fittings for supply line placed in irrigation conduit must be schedule 80.

Fittings for plastic pipe supply line larger than 4 inches must be ductile iron under section 20-2.14C(2)(b).

If UV-resistant plastic pipe supply line is required, the pipe must be homogeneous, uniform color and be manufactured of:

1. At least 80 percent vinyl chloride resin with UV stabilizers
2. Non-PVC resin modifiers and coloring ingredients
3. Coloring ingredients with UV stabilizers

20-2.09C Construction**20-2.09C(1) General**

Cut pipe straight and true. After cutting, ream out the ends to the full inside diameter of the pipe.

Prevent foreign material from entering the irrigation system during installation. Immediately before assembling, clean all pipes, valves, and fittings. Flush lines before attaching sprinklers, emitters, and other terminal fittings.

Pipe supply lines installed between the water meter and backflow preventer assembly must be installed not less than 18 inches below finished grade measured to the top of the pipe.

Where a connection is made to existing supply lines, bell and gasketed fittings or compression fittings may be used.

Install a thrust block at each change in direction on the main supply line, terminus run, and at other locations shown.

Where supply lines cross paved ditches more than 3 feet deep at their flow line, install galvanized steel pipe for the entire span of the ditch.

Secure UV resistant plastic pipe supply line on grade as shown.

20-2.09C(2) Galvanized Steel Pipe Supply Line

Coat male pipe threads on galvanized steel pipe according to the manufacturer's instructions.

20-2.09C(3) Drip Irrigation Tubing

Install drip irrigation tubing on grade and under manufacturer's instructions.

Install a flush valve and an air-relief valve if recommended by the drip valve assembly manufacturer.

20-2.09C(4) Plastic Pipe Supply Line

For PVC pipe 1-1/2 inches in diameter or smaller, cut the pipe with PVC cutters.

For solvent-cemented type joints, apply primer and solvent-cement separately under the manufacturer's instructions.

Wrap the male portion of each threaded plastic pipe fitting with at least 2 layers of pipe thread sealant tape.

Install plastic pipe supply line mains with solvent-cemented type joints not less than 18 inches below finished grade measured to the top of the pipe.

Install plastic pipe supply line laterals with solvent-cemented type joints not less than 12 inches below finished grade measured to the top of the pipe.

Snake plastic pipe installed by trenching and backfilling methods.

20-2.09D Payment

Supply line pipe and drip irrigation tubing are measured along the slope.

20-2.10 SPRINKLER ASSEMBLIES

20-2.10A General

Section 20-2.10 includes specifications for installing sprinkler assemblies.

20-2.10B Materials

20-2.10B(1) General

Each sprinkler assembly must meet the characteristics shown in the irrigation legend.

Where shown, a sprinkler assembly must have a flow shut-off device that automatically stops the flow of water on the downstream side of the device when the assembly is broken. You may use a sprinkler assembly with a preinstalled flow shut-off device or you must install a flow shut-off device under the manufacturer's instructions.

Flexible hose for sprinkler assembly must be leak-free, nonrigid and comply with ASTM D 2287, cell Type 6564500. The hose wall thickness must comply with ASTM D 2122 for the hose diameters shown in the following table:

Hose diameter, nominal (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 20-2.09B(5).

20-2.10B(2) Pop-Up Sprinkler Assemblies

Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure compensation device, check valve, sprinkler protector, and fittings as shown.

20-2.10B(3) Riser Sprinkler Assemblies

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Each riser sprinkler assembly must include a riser or flexible hose, threaded nipple, swing joint, check valve, and nozzle as shown. The riser must be UV resistant schedule 80, PVC 1120 or PVC 1220 pipe and comply with ASTM D 1785.

20-2.10B(4) Tree Well Sprinkler Assemblies

Each tree well sprinkler assembly must include a body, riser, swing joint, perforated drainpipe, and drain cap.

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The perforated drainpipe must be commercial grade, rigid, PVC pipe with holes spaced not more than 6 inches on center on 1 side of the pipe.

Drain cap must be commercially available, 1 piece, injection molded drain grate manufactured from structural foam polyolefins with UV light inhibitors. Drain grate must be black.

Gravel for filling the drainpipe must be graded such that 100 percent passes the 3/4-inch sieve and 100 percent is retained on the 1/2-inch sieve. Gravel must be clean, washed, dry, and free from clay or organic material.

20-2.10C Construction

Install pop-up and riser sprinkler assembly:

1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 3 feet from fences and walls

If sprinkler assembly cannot be installed within these limits, the location will be determined by the Engineer.

Set sprinkler assembly riser on slopes perpendicular to the plane of the slope.

Install tree well sprinkler assembly as shown.

20-2.10D Payment

Not Used

20-2.11 VALVES

20-2.11A General

Section 20-2.11 includes specifications for installing valves.

20-2.11B Materials

20-2.11B(1) General

Valves must:

1. Include a valve box and cover
2. Be the same size as the supply line that the valve serves unless otherwise shown

3. Be bottom, angled, or straight inlet configuration

20-2.11B(2) Ball Valves

Ball valve must be a two-piece brass or bronze body and comply with the requirements shown in the following table:

Property	Requirements
Nonshock working pressure, min	400 psi
Seats	PTFE
O-ring seals	PTFE

Ball valve must be the same size as the supply line that the valve serves.

20-2.11B(3) Check Valves

Each check valve must:

1. Be schedule 80 PVC and factory set to 5 psi for adjustable spring check valve
2. Be Class 200 PVC for swing check valves on non pressurized plastic irrigation supply line

20-2.11B(4) Drip Valve Assemblies

Each drip valve assembly must include:

1. Remote control valve
2. Wye filter with:
 - 2.1. Filter housing that:
 - 2.1.1. Can withstand a working pressure of 150 psi
 - 2.1.2. Is manufactured of reinforced polypropylene plastic
 - 2.2. Reusable stainless steel filter cartridge with a 200 mesh size filtration
3. Ball valve under 20-2.11B(2)
4. Schedule 80 PVC pipes and fittings
5. Pressure regulator

20-2.11B(5) Garden Valve Assemblies

Each garden valve assembly must have:

1. Garden valve
2. Location marker

20-2.11B(6) Gate Valves

Gate valves must be:

1. Flanged or threaded type
2. Iron or bronze body
3. Bronze trimmed with one of the following:
 - 3.1. Internally threading rising stem
 - 3.2. Nonrising stem
4. Able to withstand a working pressure of 150 psi
5. Same size as the pipeline that the valves serves unless otherwise shown

Gate valves smaller than 3 inches must have a cross handle.

Gate valves 3 inches or larger must be flanged type with a square nut. Furnish 3 long shank keys before Contract acceptance.

Gate valves attached to the outlets of a wye strainer must have seating rings on the discharge side of the gate valves must be PTFE. Valve wedges must be driven obliquely by cam action into the seating rings.

20-2.11B(7) Pressure Regulating Valves

Pressure regulating valve must be:

1. Flanged or threaded type
2. Brass, bronze, cast iron, or plastic body
3. Spring diaphragm type
4. Pilot controlled

Pressure regulating valve must have no internal filter screens.

20-2.11B(8) Pressure Relief Valves

Pressure relief valve must have a brass or bronze body, stainless steel springs, bronze nickel chrome seats, composition seat discs, female bottom inlets, and female side outlets.

20-2.11B(9) Quick Coupling Valves

Quick coupling valve must be 3/4 inch double slotted with a self-closing cap, 3/4-inch brass key and 3/4-inch brass hose swivel unless otherwise shown. Except for the cap, quick coupling valve must be brass or bronze construction. Furnish 3 loose quick coupling brass keys and brass hose swivels before Contract acceptance.

20-2.11B(10) Remote Control Valves

20-2.11B(10)(a) General

Each remote control valve must:

1. Be normally closed type.
2. Be glass filled nylon, brass, or bronze.
3. Be completely serviceable from the top without removing the valve body from the system.
4. Be equipped with a device that regulates and adjusts the flow of water and be provided with a manual shut-off. The manual shut-off for valves larger than 3/4 inch must be operated by a cross handle.
5. Have solenoids compatible with the irrigation controller.
6. Have a manual bleed device.
7. Be capable of withstanding a pressure of 200 psi
8. Have replaceable compression discs or diaphragms.
9. Have threaded fittings for inlets and outlets.
10. Have DC latching solenoids when used with solar or battery controllers. Solenoids must operate on 3.5 V.

20-2.11B(10)(b) Remote Control Valves with Flow Sensor

Reserved

20-2.11B(10)(c) Remote Control Valves with Pressure Regulator

Each remote control valve with pressure regulator must be factory assembled as 1 unit.

20-2.11B(11) Wye Strainer Assemblies

Each wye strainer assembly must include:

1. Wye strainer
2. Garden valve

20-2.11C Construction

20-2.11C(1) General

Install control valves:

1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 3 feet from fences, walls, or both

If a control valve cannot be installed within these limits, the location will be determined by the Engineer.

20-2.11C(2) Check Valves

Unless otherwise shown, install spring-action check valves as necessary to prevent low head drainage.

20-2.11C(3) Garden Valve Assemblies

Install a location marker 8 to 10 inches from the back of each garden valve.

20-2.11C(4) Pressure Regulating Valves

Install pressure regulating valves with threaded connections and a union on the inlet side of the valves.

20-2.11C(5) Wye Strainer Assemblies

Unless shown, install wye strainer assembly on the upstream side of the remote control valves.

Install garden valve so that when the system is flushed, the discharge sprays out of the valve box.

20-2.11D Payment

Not Used

20-2.12 WATER METERS

Reserved

20-2.13 RESERVED**20-2.14 SUPPLY LINE ON STRUCTURES****20-2.14A General****20-2.14A(1) General****20-2.14A(1)(a) Summary**

Section 20-14 includes specifications for installing water supply lines through bridges and on the exterior of concrete structures.

20-2.14A(1)(b) Definitions

Reserved

20-2.14A(1)(c) Submittals

Submit a work plan for temporary casing support at the abutments as an informational submittal.

20-2.14A(1)(d) Quality Control and Assurance**20-2.14A(1)(d)(i) General**

Before installing seismic expansion assemblies or expansion assemblies, the Engineer must authorize the extension setting.

20-2.14A(1)(d)(ii) Regulatory Requirements

Piping materials must bear the label, stamp, or other markings of the specified standards.

20-2.14A(1)(d)(iii) Site Tests

Test water supply lines before:

1. Backfilling
2. Beginning work on box girder cell decks
3. Otherwise covering the water supply lines

Furnish pipe anchorages to resist thrust forces occurring during testing.

Test the water supply lines as 1 unit. The limits of the unit must be 5 feet beyond the casing at each end of the bridge.

Cap each end of the water supply lines before testing. Caps must be rated for the test pressure.

Test water supply lines under section 20-2.01A(4)(b), except that the testing period must be 4 hours with no pressure drop.

For water supply lines 4 inches and larger testing must meet the following additional requirements:

1. Testing pressure must be at least 120 psi
2. Air relief valve must not be subjected to water pressure due to testing

If water supply lines fail testing, retest the lines after repair.

20-2.14A(2) Materials

20-2.14A(2)(a) General

Protect stored piping from moisture and dirt. Elevate piping above grade. Support piping to prevent sagging and bending.

Protect flanges, fittings, and assemblies from moisture and dirt.

20-2.14A(2)(b) Air Release Valve Assemblies

Air release valve assemblies include an air release valve, ball valve, tank vent, nipples, and pipe saddle. Assemblies must comply with the following:

1. Air release valves must have a cast iron body with stainless steel trim and float, 1-inch NPT inlet, 1/2-inch NPT outlet, and 3/16-inch orifice.
2. Ball valves must have a 2-piece bronze body with chrome plated or brass ball, 1-inch full-size port, and be rated for at least 400 psi.
3. Tank vents must have a 1/2-inch NPT inlet and downward-facing double openings with screened covers.
4. Nipples must be schedule 40 galvanized steel pipe.
5. Pipe saddle must be rated for at least 150 psi and compatible with water supply line. Pipe saddle must be (1) single strap pipe saddle for water supply lines smaller than 4 inches or (2) double strap pipe saddle for water supply lines 4 inches and larger. You may use a tee fitting for galvanized steel water supply lines.

20-2.14A(2)(c) Casings

Casings must be welded steel pipe casing complying with section 70-7.

20-2.14A(2)(d) Pipe Wrap Tape

Pipe wrap tape must be pressure sensitive tape made from PVC or polyethylene. Pipe wrap tape must be at least 50 mils thick and not wider than 2 inches.

20-2.14A(2)(e) Pipe Hangers

Pipe hangers must comply with section 70-7.02C.

The pipe hanger must be rated for the water supply line. If casings are shown, include the casings weight.

20-2.14A(2)(f) Epoxy Adhesives

Epoxy used for anchoring concrete pipe supports must comply with section 70-7.02D.

20-2.14A(2)(g) Concrete Pipe Supports

Concrete pipe supports must comply with section 70-7.02D.

20-2.14A(2)(h) Pipe Clamps and Anchors

Metal clamps must be commercial quality steel complying with section 75-1.02. Anchors must comply with the specifications for concrete anchorage devices in section 75-1.03C.

20-2.14A(2)(i) Pull Boxes

Pull boxes and covers must comply with section 20-2.01B(5).

20.2.14A(3) Construction

20-2.14A(3)(a) General

Support water supply lines as described.

Where water supply lines penetrate bridge superstructure concrete, either form or install pipe sleeves at least 2 pipe sizes larger than the pipe.

20-2.14A(3)(b) Preparation

Clean the interior of the pipe before installation. Cap or plug openings as pipe is installed to prevent the entrance of foreign material. Leave caps or plugs in place until the next pipe section is installed.

20-2.14A(3)(c) Installation**20-2.14A(3)(c)(i) General**

Reserved

20-2.14A(3)(c)(ii) Casings

Install casings under section 70-7.03.

Seal casing end with 8 inches of polyurethane foam at dirt stop or pipe end seal.

20-2.14A(3)(c)(iii) Wrapping Water Supply Line

Wrap damaged supply line coatings with pipe wrap tape. Wrap field joints and fittings that are in contact with the earth.

Wrapping must comply with the following:

1. Clean and prime area as recommended by the tape manufacturer.
2. Tightly wrap tape with 1/2 uniform overlap, free from wrinkles and voids, to provide not less than a 100 mil thickness.
3. The tape must conform to joint or fitting contours.
4. Extend tape at least 6 inches over adjacent pipe.

20-2.14A(3)(c)(iv) Pipe Clamps and Anchors

Install water supply lines on the exterior surfaces of bridges or other concrete structures with metal clamps and anchors.

Drilling of holes for anchors must comply with the following:

1. Drill holes to manufacturers recommended depth.
2. Drilling tools must be authorized.
3. Do not drill holes closer than 6 inches to the edge of a concrete structure.
4. Relocate holes if reinforcing steel is encountered. Fill abandoned holes with mortar. Mortar must comply with section 51-1.02F.

Where water supply lines are mounted vertically for more than 2 feet, install clamps and anchors within 6 inches of the elbows.

Where water supply lines are mounted vertically for more than 10 feet, install additional clamps and anchors at 10 foot centers unless otherwise shown.

20-2.14A(3)(d) Sequences of Operation

If the bridge superstructure is to be prestressed do not place mortar around casings in abutments and hinges until bridge superstructure prestressing has been completed.

20-2.14A(4) Payment

Supply line on structures is measured from end to end, along the centerline.

The Department does not pay for failed tests.

20-2.14B Supply Line on Structures, Less than 4 Inches**20-2.14B(1) General****20-2.14B(1)(a) Summary**

Section 20-2.14B includes specifications for installing water supply lines smaller than 4 inches.

20-2.14B(1)(b) Definitions

Reserved

20-2.14B(1)(c) Submittals

Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:

1. Water supply line
2. Expansion assemblies
3. Casing insulators
4. Pipe end seals
5. Pipe anchorages
6. Air release valve assemblies
7. Casings
8. Pipe hangers
9. Epoxy adhesives
10. Concrete pipe supports

20-2.14B(1)(d) Quality Control and Assurance

Reserved

20-2.14B(2) Materials**20-2.14B(2)(a) General**

Reserved

20-2.14B(2)(b) Water Supply Line

Water supply lines must comply with section 20-2.09.

20-2.14B(2)(c) Expansion Assemblies

Expansion assemblies must consist of a hose with ends, insulated flange connections, and elbows. Expansion assemblies must have the same nominal inside diameter as the water supply line. Working pressure must be at least 150 psi.

Hose must be medium or heavy weight, crush and kink resistant, rated for at least 150 psi. Cover must be flexible, oil resistant rubber or synthetic, reinforced with at least 2-ply synthetic yarn or steel wire. The inner tube must meet FDA and USDA Standards for potable water. Hose ends must be stainless steel flanged connections with stainless steel crimped bands or swaged end connectors. Do not use barbed ends with band clamps.

Elbows must be 45 degree, standard weight galvanized steel fittings.

20-2.14B(2)(d) Casing Insulators

Casing insulators must be:

1. 2-piece, high-density, injection-molded polyethylene, nonconductive inner liner, with cadmium-plated nuts and bolts.
2. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any contact between pipe and casing and have at least 2 runners seated on the bottom of the casing.
3. Sized for the casing and water supply line shown.

20-2.14B(2)(e) Pipe Anchorages

Pipe anchorages must consist of an I-beam, U-bolts, anchors, and double nuts.

Use concrete anchorage devices for anchors on existing bridges. Use L-anchor bolts for anchors on new bridges.

Fabricate the I-beam from 1/2-inch steel plate. Steel plate, U-bolts, L-anchors, and nuts must comply with section 75-1.02. Concrete anchorage devices must comply with section 75-1.03C.

20-2.14B(2)(f) Pipe End Seals

Pipe end seals must consist of a pipe end seal, stainless steel bands, and polyurethane foam.

Pipe end seal must be factory constructed from seamless neoprene and sized for the casing and water supply line shown. Neoprene must be at least 1/8 inch thick. Stainless steel bands must be crimped.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

20-2.14B(3) Construction

Locate pipe anchorage halfway between expansion assemblies.

Pipe end seal must be pulled onto the casing during pipe installation. Do not use wrap-around type end seals.

20-2.14B(4) Payment

Supply line on structures is paid for as galvanized steel pipe (supply line on bridge).

20-2.14C Supply Line on Structures, 4 Inches and Larger

20-2.14C(1) General

20-2.14C(1)(a) Summary

Section 20-2.14C includes specifications for installing water supply lines 4 inches and larger.

20-2.14C(1)(b) Definitions

Reserved

20-2.14C(1)(c) Submittals

Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:

1. Water supply line
2. Expansion assemblies
3. Flange insulating gaskets
4. Casing insulators
5. Seismic expansion assemblies
6. Lateral restraint assemblies
7. Air release valve assemblies
8. Casings
9. Pipe hangers
10. Epoxy adhesives
11. Concrete pipe supports

Submit the maximum range and preset dimension for each expansion assembly or seismic expansion assembly as an informational submittal.

Submit at least 5 sets of product data to OSD, Documents Unit. Each set must be bound together and include an index stating equipment names, manufacturers, and model numbers. Two sets will be returned. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.

20-2.14C(1)(d) Quality Control and Assurance

Reserved

20-2.14C(2) Materials

20-2.14C(2)(a) General

Reserved

20-2.14C(2)(b) Water Supply Line

Water supply lines must consist of ductile iron pipe and fittings. Pipe must comply with ANSI/AWWA C151/A21.51, Class 350. Fittings must comply with ANSI/AWWA C110/A21.10, rated for a working pressure of 350 psi.

Ductile iron pipe connections to expansion assemblies must be a flanged joint complying with ANSI/AWWA C115/A21.15. Flange gaskets must be rated for a working pressure of 350 psi. Fasteners must comply with section 75-1.02, except that stainless steel fasteners must not be used.

All other ductile iron pipe and fitting joints must be push-on, restrained type complying with ANSI/AWWA C111/A21.11. Push-on, restrained type joints may use proprietary dimensions and proprietary restrained joint locking systems.

Ductile iron pipe and fittings must have an asphaltic coating complying with ANSI/AWWA C151/A21.51, and a cement mortar lining complying with ANSI/AWWA C104/A21.4.

20-2.14C(2)(c) Expansion Assemblies

Expansion assemblies must be a sleeve type expansion joint. The expansion assembly must have:

1. Ductile iron body complying with ANSI/AWWA C153/A21.53
2. Flanged ends complying with ANSI/AWWA C110/A21.10
3. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
4. Internal expansion sleeve limiting stop collars and be pressure balanced
5. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches
6. NSF 61 certification

The expansion assembly must be factory set at 1/2 the extension capacity.

20-2.14C(2)(d) Flange Insulating Gaskets

Flange insulating gaskets must consist of a dielectric flange gasket, insulating washers and sleeves, and commercial quality steel bolts and nuts. Dielectric flange gasket must have a dielectric strength of at least 500 vpm.

20-2.14C(2)(e) Casing Insulators

Casing insulators must be:

1. 2-piece, 8-inch, 14-gauge epoxy-coated or galvanized steel band, four 2-inch-wide glass-reinforced polyester or polyethylene runners, with cadmium-plated nuts and bolts.
2. Coated with at least 15-mils heat-fused PVC to provide a nonconductive inner liner.
3. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any pipe to casing contact and have at least 2 runners seated on the bottom of the casing.
4. Sized for the casing and water supply line shown.

20-2.14C(2)(f) Dirt Stops

Dirt stops must consist of a redwood cover with polyurethane foam.

Use construction heart grade redwood complying with 57-2.01B(2). Construct cover to fit snugly around the water supply line. The cover must be 2 inches taller and 2 inches wider than the casing.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

20-2.14C(2)(g) Seismic Expansion Assemblies

Seismic expansion assemblies must be a sleeve type expansion joint with integral ball joints at each end.

Seismic expansion assemblies must have:

1. Ability to withstand at least 15 degree angular deflection at each end and maximum movement in all 3 planes at the same time
2. Ductile iron body complying with ANSI/AWWA C153/A21.53
3. Flanged ends complying with ANSI/AWWA C110/A21.10
4. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
5. Internal expansion sleeve limiting stop collars and pressure balanced
6. Ball joints contained in flanged retainers with seal gaskets
7. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches

8. NSF 61 certification

The seismic expansion assembly must be factory set at 1/2 the extension capacity.

20-2.14C(2)(h) Lateral Restraint Assemblies

Lateral restraint assemblies must be (1) constructed from commercial quality steel components complying with section 75-1.02, (2) adjustable, and (3) able to resist a horizontal force of 10 percent of the contributory dead load.

20-2.14C(3) Construction

Each ductile iron pipe must be connected and fully extended (pulled out) after joint assembly before the next pipe section is added.

Install flange insulating gaskets on the outside flange of seismic expansion assemblies and expansion assemblies.

20-2.14C(4) Payment

Supply line on structures is paid for as supply line (bridge).

20-2.15 TEMPORARY IRRIGATION SYSTEMS

Reserved

20-2.16–20-2.19 RESERVED

20-3 PLANTING

20-3.01 GENERAL

20-3.01A General

20-3.01A(1) Summary

Section 20-3 includes specifications for performing planting work in new and existing landscapes.

20-3.01A(2) Definitions

Reserved

20-3.01A(3) Submittals

20-3.01A(3)(a) General

Submit nursery invoices showing species or variety and inspection certificates for plants.

Submit documentation of clearance from the county agricultural commissioner for plants obtained from a county outside the project limits.

If a root stimulant is required, submit a copy of the root stimulant manufacturer's product sheet and instructions for the application of the root stimulant.

If cuttings are to be taken from outside the right-of-way, submit proof of permits and payment of associated fees. Notify the Engineer of the location at least 15 days before taking cuttings.

20-3.01A(3)(b) Vendor Statements

At least 60 days before planting the plants, submit a statement from the vendor that the order for the plants required, including sample plants used for inspection, has been received and accepted by the vendor. The statement from the vendor must include the plant names, sizes, and quantities and the anticipated delivery date.

20-3.01A(3)(c) Certificates of Compliance

Submit a certificate of compliance for:

1. Sod
2. Soil amendment

20-3.01A(4) Quality Control and Assurance

Plants must comply with federal and state laws requiring inspection for diseases and infestations. Inspection certificates required by law must accompany each shipment of plants.

Obtain clearance from the county agricultural commissioner before planting plants delivered from a county outside the project limits.

The Engineer inspects the roots of container-grown sample plants by removing earth from the rootball of not less than 2 plants, nor more than 2 percent of the total number of plants of each species or variety. If container-grown plants are purchased from several sources, the Engineer inspects the roots of not less than 2 of each sample plant species or variety from each source. The rootball of container grown plants must not show evidence of being underdeveloped, deformed, or having been restricted.

If the Engineer finds noncompliant plants, the entire lot represented by the noncompliant sample plants will be rejected.

Cuttings with mature or brown stems and cuttings that have been trimmed will be rejected.

20-3.01B Materials

20-3.01B(1) General

Notify the Engineer at least 10 days before the plants are shipped to the job site.

20-3.01B(2) Plants

20-3.01B(2)(a) General

Plants must be the variety and size shown and true to the type or name shown. Plants must be individually tagged or tagged in groups identifying the plants by species or variety. Tagging is not required for cuttings.

Plants must be healthy, well-formed, not root-bound, free from insect pests and disease, and grown in nurseries inspected by the Department of Food and Agriculture.

The plants must comply with the size and type shown in the following table:

Plant group designation	Description	Container size (cu in)
A	No. 1 container	152–251
B	No. 5 container	785–1242
C	Balled and burlapped	--
E	Bulb	--
F	In flats	--
H	Cutting	--
I	Pot	--
K	24-inch box	5775–6861
M	Liner ^a	--
O	Acorn	--
P	Plugs ^{a, b}	--
S	Seedling ^c	--
U	No. 15 container	2768–3696

^aDo not use containers made of biodegradable material.

^bGrown in individual container cells.

^cBare root.

Trucks used for transporting plants must be equipped with covers to protect plants from windburn.

Handle and pack plants in an authorized way for the species or variety.

20-3.01B(2)(b) Cuttings**20-3.01B(2)(b)(i) General**

Take cuttings at random from healthy, vigorous plants. Make cuts with sharp, clean tools. Do not take more than 25 percent of an individual plant and not more than 50 percent of the plants in an area.

Keep cuttings covered and wet until planted. Do not allow cuttings to dry or wither.

Plant cuttings no more than 2 days after being cut.

20-3.01B(2)(b)(ii) *Carpobrotus* and *Delosperma* Cuttings

You may take cuttings for new *Carpobrotus* and *Delosperma* groundcover from the existing highway planting areas, but these areas may not provide enough material to complete the work. Contact the local District's encroachment permit office to obtain a permit to harvest cuttings, identify acceptable cutting harvest areas, and to determine acceptable quantities to take.

Take tip cuttings from healthy, vigorous *Carpobrotus* and *Delosperma* plants that are free of pests and disease.

Carpobrotus cuttings must be 10 inches or more in length and not have roots.

Delosperma cuttings must be 6 inches or more in length and not have roots.

20-3.01B(2)(b)(iii) Willow Cuttings

Take willow cuttings from areas shown or designated by the Engineer.

Willow cuttings must be:

1. Reasonably straight
2. 20 to 24 inches in length
3. 3/4 to 1-1/2 inch in diameter at the base of the cutting

Cut the top of each willow cutting square above a leaf bud. Cut the base below a leaf bud at approximately a 45 degree angle. Trim off leaves and branches flush with the stem of the cutting.

20-3.01B(2)(b)(iv) Cottonwood Cuttings

Cottonwood cuttings must comply with the requirements for willow cuttings in section 20-3.01B(2)(b)(iii).

20-3.01B(2)(b)(v)–20-3.01B(2)(b)(viii) Reserved**20-3.01B(2)(c) Sod**

Sod must:

1. Be grown to comply with the Food & Agri Code
2. Be free from weeds and undesirable types of grasses and clovers
3. Be field-grown on soil containing less than 50 percent silt and clay
3. Have less than 1/2-inch-thick thatch
4. Not be less than 8 months or more than 16 months old
5. Be machine-cut to a uniform soil thickness of $5/8 \pm 1/4$ inch, not including top growth and thatch

Protect sod with tarps or other protective covers during delivery. Do not allow sod to dry out during delivery or before placement.

20-3.01B(3) Soil Amendment

Soil amendment must comply with the requirements in the Food & Agri Code. Soil amendment must be one or a combination of the following:

1. Sphagnum peat moss
2. Nitrolized fir bark
3. Vermiculite
4. Perlite

20-3.01B(4) Fertilizers

20-3.01B(4)(a) General

Deliver fertilizer in labeled containers showing weight, chemical analysis, and manufacturer's name.

Fertilizer must comply with the requirements of the Food & Agri Code.

20-3.01B(4)(b) Slow-release Fertilizers

Slow-release fertilizer must be a pelleted or granular form with a nutrient release over an 8 to 12 month period and must comply with the chemical analysis ranges shown in the following table:

Ingredient	Content (percent)
Nitrogen (N)	16-21
Phosphoric acid (P)	6-8
Water soluble potash (K)	4-10

20-3.01B(4)(c) Packet Fertilizers

Packet fertilizer must be a biodegradable packet with a nutrient release over a 12 month period. Each packet must have a weight of 10 ± 1 grams and must comply with the chemical analysis shown in the following table:

Ingredient	Content (percent)
Nitrogen(N)	20
Phosphoric acid (P)	10
Water soluble potash (K)	5

20-3.01B(4)(d) Organic Fertilizers

Organic fertilizer must be pelleted or granular with a cumulative nitrogen release rate of no more than 70 percent for the first 70 days after incubation at 86 degrees F with 100 percent at 350 days or more. Organic fertilizer must comply with the chemical analysis shown in the following table:

Ingredient	Content (percent)
Nitrogen (N)	5-7
Phosphoric acid (P)	1-5
Water soluble potash (K)	1-10

20-3.01B(5) Root Stimulants

Root stimulant must be a commercial quality product.

20-3.01B(6) Plaster Sand

Backfill material for the transplant palm tree planting holes must be 100 percent commercial quality washed plaster sand.

20-3.01B(7) Root Barrier

Root barrier must be an injection molded or extruded modular panel made of high-density polypropylene or polyethylene plastic.

Each panel must:

1. Be at least 1/16-inch thick
2. Have at least 4 molded root-deflecting vertical ribs 0.5- to 0.8-inch wide, 6 to 8 inches apart
3. Have a locking strip or an integral male-female sliding lock designed to resist slippage between panels
4. Be at least 2 feet wide and 2 feet in depth

20-3.01B(8) Root Protectors

Each root protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Closed bottom design with a height and diameter that provides a minimum of 6 inches of clearance between the root ball and the sides and bottom of the wire cylinder

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points.

20-3.01B(9) Foliage Protectors

Each foliage protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Approximately 4 feet high and 2 feet in diameter

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points. Other wire edges that are cut must be free of sharp points.

Support stakes must be one of the following:

1. 3/4-inch reinforcing steel bar a minimum of 5 feet long with an orange or red plastic safety cap that fits snugly onto the top of the reinforcing steel bar
2. 2 inch nominal diameter or 2 by 2 inch nominal size wood stakes a minimum of 5 feet long. Wood stakes must be straight

The jute mesh cover must comply with section 21-1.02O(2). Twine required to hold the jute mesh cover in place must be 1/8-inch diameter manila hemp twine.

20-3.01B(10) Wood Plant Stakes

Each plant stake must be nominal 2 by 2 inch or nominal 2-inch diameter and of sufficient length to keep the plant in an upright position.

Plant stakes for vines must be nominal 1 by 1 inch, 18 inches long.

20-3.01B(11) Plant Ties

Plant ties must be extruded vinyl-based tape, 1 inch wide and at least 10 mils thick.

20-3.01C Construction

20-3.01C(1) General

Apply a root stimulant under the manufacturer's instructions to the plants specified in the special provisions.

Before transporting the plants to the planting area, thoroughly wet the root ball.

20-3.01C(2) Pruning

Prune plants under the latest edition of ANSI A300 part 1, *Pruning*, published by the Tree Care Industry Association.

Do not use tree seal compounds to cover pruning cuts.

20-3.01C(3) Watering

Water existing plants to be maintained, transplanted trees, and new plants as needed to keep the plants in a healthy growing condition.

20-3.01C(4) Replacement Plants

Plants that show signs of failure to grow at any time or are so injured or damaged as to render them unsuitable for the purpose intended, must be removed, replaced, and replanted. Replace unsuitable plants within 2 weeks after the Engineer marks or indicates that the plants must be replaced.

Replacement planting must comply with the original planting requirements, spacing, and size provisions described for the plants being replaced.

Replacement planting for transplanted trees must comply with the work plan and be planted in the same planting hole.

Replacement ground cover plants must be the same species specified for the ground cover being replaced. Other replacement plants must be the same species as the plants being replaced.

Place orders for replacement plants with the vendor at the appropriate time so that the replacement plants are not in a root-bound condition.

The Department does not pay for replacement plants or the planting of replacement plants.

20-3.01C(5) Maintain Plants

Maintain plants from the time of planting until Contract acceptance if no plant establishment period is specified or until the start of the plant establishment period.

20-3.01D Payment

Reserved

20-3.02 EXISTING PLANTING

20-3.02A General

20-3.02A(1) Summary

Section 20-3.02 includes specifications for pruning existing plants, transplanting trees, and maintaining existing planted areas.

Transplant palm trees between March 15 and October 15.

20-3.02A(2) Definitions

Reserved

20-3.02A(3) Submittals

Submit a work plan for:

1. Transplanting trees. The work plan must include methods for lifting, transporting, storing, planting, guying, and maintaining each tree to be transplanted. Include root ball size, method of root ball containment, and a maintenance program for each tree.
2. Maintaining existing planted areas. The work plan must include weed control, fertilization, mowing and trimming of turf areas, watering, and controlling rodents and pests.

Submit a copy of the manufacturer's product sheet for root stimulant including application instructions.

20-3.02A(4) Quality Control and Assurance

Inspect for deficiencies of existing planted areas in the presence of the Engineer. Complete the inspection within 15 days after the start of job site activities.

Deficiencies requiring corrective action include:

1. Weeds
2. Dead, diseased, or unhealthy plants
3. Missing plant stakes and tree ties
4. Inadequate plant basins and basin mulch
5. Other deficiencies needing corrective action to promote healthy plant life
6. Rodents and pests

20-3.02B Materials

Not Used

20-3.02C Construction

20-3.02C(1) General

Correct deficiencies of existing planted areas as ordered within 15 days of the order. Correction of deficiencies is change order work.

After deficiencies are corrected, perform work to maintain existing planted areas in a neat and presentable condition and to promote healthy plant growth through Contract acceptance.

20-3.02C(2) Prune Existing Plants

Prune existing plants as shown.

If no bid item for prune existing plants is included, prune existing plants as ordered. Pruning existing plants is change order work.

20-3.02C(3) Transplant Trees

Prune each tree to be transplanted immediately before lifting.

If the tree to be transplanted is a palm, prune by removing dead fronds and frond stubs from the trunk. Remove green fronds up to 2 rows of fronds away from the center of growth. Tie the remaining 2 rows of fronds in an upright position with light hemp or manila rope. Remove fronds and frond stubs at the trunk in a manner that will not injure the trunk. Remove fronds and frond stubs for *Phoenix dactylifera* (Date Palm) approximately 4 inches from the trunk.

Prepare each hole in the new location before lifting the tree to be transplanted.

Lift tree to be transplanted as described in the work plan.

Comply with section 20-3.03C(3) for handling and planting each tree to be transplanted.

Until replanted, cover exposed root ball with wet burlap or canvas and cover the crown with 90 percent shade cloth.

Replant each tree on the same day it is lifted if possible. If the transplant location is not ready to receive the tree, store and maintain the tree to be transplanted until the transplant location is authorized. Store tree in an upright position.

Replace damaged transplanted tree under 20-3.01C(4) and with the number of trees specified in the special provisions.

The replacement trees must be planted in individual plant holes at the location determined by the Engineer within the area of the tree being replaced. Comply with section 20-3.03C(2) for the planting of the replacement trees.

20-3.02C(4) Maintain Existing Planted Areas

If a bid item for maintain existing planted areas is included, the existing plant basins must be kept well-formed and free of sediment. If the existing plant basins need repairs, and the basins contain mulch, replace the mulch after the repairs are done.

Control weeds within the existing planted area and:

1. From the existing planted area limit to the adjacent edges of paving and fences if less than or equal to 12 feet
2. From the existing planted area limit to 6 feet beyond the outer limit of the existing planted area if the adjacent edge of paving or fence is more than 12 feet away
3. Within a 3-foot radius from each existing tree and shrub

If no bid item for maintain existing planted areas is included, maintain existing planted areas as ordered. Maintain existing planted areas is change order work.

20-3.02D Payment

Not Used

20-3.03 PLANTING WORK

20-3.03A General

Section 20-3.03 includes specifications for planting plants.

20-3.03B Materials

Not Used

20-3.03C Construction

20-3.03C(1) General

Do not begin planting until authorized.

If an irrigation system is required, do not begin planting in an area until the functional test has been completed and authorized for the irrigation system serving that area.

20-3.03C(2) Preparing Planting Areas

The location of each plant is as shown unless the Engineer designates otherwise. If the Engineer designates the location, it will be marked by a stake, flag, or other marker.

Conduct work so the existing flow line in drainage ditches is maintained. Material displaced by your operations that interferes with drainage must be removed.

Where a minimum distance to a drainage ditch is shown, locate the plant so that the outer edge of its basin wall is at least the minimum distance shown for each plant involved.

Excavate each planting hole by hand digging or by drilling. The bottom of each planting hole must be flat. Do not use water for excavating the hole.

Unless a larger planting hole is specified, the planting hole must be large enough to receive the root ball or the total length and width of roots, backfill, amendments, and fertilizer. Where rock or other hard material prohibits the hole from being excavated, a new hole must be excavated and the abandoned hole backfilled.

20-3.03C(3) Planting Plants

20-3.03C(3)(a) General

Do not plant plants in soil that is too wet, too dry, not properly conditioned as specified, or in an unsatisfactory condition for planting.

Do not distribute more plants than can be planted and watered on that day.

Water plants immediately after planting. Apply water until the backfill soil around and below the roots or ball of earth around the roots of each plant is thoroughly saturated. When watering with a hose, use a nozzle, water disbursement device, or pressure reducing device. Do not allow the full force of the water from the open end of the hose to fall within the basin around any plant. Groundcover plants in areas with an irrigation system must be watered by sprinklers. Several consecutive watering cycles may be necessary to thoroughly saturate the soil.

If shown, install root barriers between trees and concrete sidewalk or curb. Install panels flush with finished grade and join with locking strips or integral male-female sliding locks. Install barriers with root deflectors facing inward.

If a tree grate is shown, install root barrier panels 0.5 inch above finish grade or as shown.

Adjust planting locations so that each tree or shrub is at least 8 feet away from any sprinkler.

Where a tree, shrub, or vine is to be planted within a groundcover area or cutting planting area, plant it before planting groundcover or cuttings.

Where shrubs and groundcovers are shown to be planted in groups, the outer rows directly adjacent to the nearest roadway or highway fence must be parallel to the nearest roadway or highway fence. Stagger shrubs and groundcovers in adjacent rows. Adjust the alignment of the plants within the outer rows.

Core holes in concrete masonry block wall as shown.

Where a vine is to be planted against a wall or fence, plant it as close as possible to the wall or fence. If a vine planted next to a wall is to be staked, stake and tie the vine at the time of planting. A vine planted next to a fence must be tied to the fence at the time of planting.

Protect tree trunks from injury. Do not:

1. Drag tree
2. Use chains to move a tree
3. Lay tree on the ground

20-3.03C(3)(b) Trees, Shrubs, and Vines

After preparing holes, thoroughly mix soil amendment and granular fertilizer at the rate shown with native soil to be used as backfill material. Remove containers from plants in such a manner that the ball of earth surrounding the roots is not broken. Do not cut plant containers before delivery of the plants to the planting area. Plant and water plants immediately after removal from their containers.

Place packet fertilizer in the backfill within 6 to 8 inches of the ground surface and approximately 1 inch from the root ball. If more than 1 packet is required per plant, distribute the packets evenly around the root ball.

If a root stimulant is to be used, apply it according to the manufacturer's instructions.

If required, install root protectors in the plant holes as shown.

Ensure roots are not restricted or distorted.

Distribute backfill uniformly throughout the entire depth of the plant hole without clods or lumps. After the planting holes have been backfilled, jet water into the backfill with a pipe or tube inserted into the bottom of the hole until the backfill material is saturated for the full depth. If the backfill material settles below this level, add additional backfill to the required level. If a plant settles deeper than shown, replant it at the required level.

Remove nursery stakes after planting.

Install 2 plant stakes for each plant to be staked at the time of planting as shown. Ensure the rootball is not damaged.

Tie the plant to the stakes with 2 plant ties, 1 tie to each stake. Each tie must form a figure 8 by crossing the tie between the plant and the stake as shown. Install ties at the lowest position that will support the plant in an upright position. Ties must provide trunk flexibility but not allow the trunk to rub against the stakes. Wrap each end of the tie 1-1/2 turns around the stake and securely tie.

Construct a watering basin around each plant as shown.

If required, install a foliage protector:

1. Over the plant within 2 days after planting.
2. Vertically and centered over the plant as shown

If foliage protectors are required:

1. Cut the bottom of the wire cylinder to match the slope of the ground. Do not leave sharp points of wire after cutting. Sharp points must be bent over or blunted.
2. Install 2 support stakes for foliage protectors vertically and embed in the soil on opposite sides of the plant as shown and in a transverse direction to the prevailing wind.
3. Either weave the support stakes through the wire cylinder mesh at 6 inch maximum centers or fasten the wire cylinder to the support stakes at 6 inch maximum centers.
4. Wire cylinder must be snug against the support stakes but loose enough to be raised for pesticide application or to perform weeding within the plant basin.
5. Install jute mesh cover over the foliage protector and secure with twine as shown.

20-3.03C(3)(c) Groundcover Plants

Each groundcover planting area irrigated by a single control valve must be completely planted and watered before planting other groundcover planting areas.

Plant groundcover plants in moist soil, and in neat, straight rows, spaced as shown.

Apply fertilizer to groundcover plants and water into the soil immediately after planting.

20-3.03C(3)(d) Cuttings, Liners, Plugs, and Seedling Plants

20-3.03C(3)(d)(i) General

Apply fertilizer to cuttings, liners, plugs, and seedling plants and water immediately after planting.

Ensure the soil is moist to a minimum depth of 8 inches before planting cuttings.

If a root stimulant is to be used, apply it according to the manufacturer's instructions.

20-3.03C(3)(d)(ii) Willow Cuttings

Unless otherwise shown, for willow cuttings excavate planting holes perpendicular to the ground line by using a steel bar, auger, post hole digger, or similar tools. Holes must be large enough to receive the cuttings and fertilizer packet. Plant willow cuttings to the specified depths without damaging the bark.

Where rock or other hard material prohibits the excavation of the planting holes, excavate new holes and backfill the unused holes.

Plant willow cuttings during the period specified in the special provisions.

Apply root stimulant according to the manufacturer's instructions.

Plant the base of the cutting 10 to 12 inches deep with 3 to 5 bud scars exposed above the ground. If more than 5 bud scars are exposed, trim off the excess willow cutting length.

Place 1 fertilizer packet in the backfill of each cutting, 6 to 8 inches below the ground surface and approximately 1 inch from the cutting.

Backfill the plant holes with excavated material after planting. Distribute the excavated material evenly within the hole without clods, lumps, or air pockets. Compact the backfill so that the cutting cannot be easily removed from the soil. Do not damage the cutting's bark.

Dispose of trimmings and unused cuttings.

20-3.03C(3)(d)(iii) Cottonwood Cuttings

Reserved

20-3.03C(3)(d)(iv) *Carpobrotus* and *Delosperma* Cuttings

Plant *Carpobrotus* cuttings to a depth so that not less than 2 nodes are covered with soil. The basal end of *Delosperma* cuttings must not be less than 2 inches below the surface of the soil and the basal end of *Carpobrotus* cuttings must not be less than 4 inches below the surface of the soil.

Apply root stimulant to *Delosperma* cuttings before planting.

Do not plant *Carpobrotus* or *Delosperma* cuttings in soil that does not contain sufficient moisture at an average depth of 2 inches below the surface.

20-3.03C(3)(d)(v) Liner Plants

Plant liner plants during the period specified in the special provisions.

If a foliage protector is required, install under section 20-3.03C(3)(b).

20-3.03C(3)(d)(vi) Plug Plants

Plant plug plants during the period specified in the special provisions.

20-3.03C(3)(d)(vii) Seedling Plants

Plant seedling plants during the period specified in the special provisions.

20-3.03C(3)(e) Sod

After all other planting is performed, grade sod areas to drain and to a smooth and uniform surface. Fine grade and roll sod areas before placing sod.

Areas adjacent to sidewalks, edging, and other paved borders and surfaced areas must be 1 inch below the finished surface elevation of the facilities, after fine grading, rolling, and settlement of the soil.

Place sod such that the end of each adjacent strip is staggered a minimum of 2 feet. Place the edge and end of sod firmly against adjacent sod and against sidewalks, edging, and other paved borders and surfaced areas.

Lightly roll the entire sodded area to eliminate air pockets and ensure close contact with the soil after placement of sod. Water the sodded areas so that the soil is moist to a minimum depth of 4 inches after rolling. Do not allow the sod to dry out.

If irregular or uneven areas appear in the sodded areas, restore to a smooth and even appearance.

Trim sod to a uniform edge at sidewalks, edging, and other paved borders and surfaced areas. Trimming must be repeated whenever the edge of sod extends 1 inch beyond the edge of the edging, sidewalks, and other paved borders and surfaced areas. Remove and dispose of trimmed sod.

Mow sod when it has reached a height of 4 inches. Mow sod to a height of 2.5 inches.

20-3.03D Payment

Soil amendment is measured in the vehicle at the point of delivery.

Measurement for slow-release fertilizer, organic fertilizer, or iron sulfate is determined from marked weight or sack count.

Various sizes and types of plants are measured by either the product of the average plant density and the total area planted or by actual count of the living plants in place, determined by the Engineer. The average plant density is the number of living plants per sq yd determined from actual count of test areas chosen representing the total planted area. The size and location of the test areas is determined by you and the Engineer, except that the total area tested must be equal to not less than 3 percent nor more than 5 percent of the planted area being determined. The Engineer makes the final determination of the areas to be tested.

20-3.04–20-3.08 RESERVED

20-4 PLANT ESTABLISHMENT WORK

20-4.01 GENERAL

20-4.01A Summary

Section 20-4 includes specifications for performing plant establishment work.

Plant establishment consists of caring for the plants, including watering, fertilizing, pruning, replacing damaged plants, pest control, and operating and repairing of all existing irrigation facilities used and irrigation facilities installed as part of the new irrigation system.

Working days on which no work is required, as determined by the Engineer, will be credited as a plant establishment working day, regardless of whether or not you perform plant establishment work.

Working days whenever you fail to adequately perform plant establishment work will not be credited toward the plant establishment working days.

20-4.01B Definitions

Type 1 plant establishment: Plant establishment period with the number of working days specified for plant establishment beginning after all work has been completed except for plant establishment work and other bid items specified to be performed until Contract acceptance.

Type 2 plant establishment: Plant establishment period with the number of working days specified for plant establishment beginning after all planting work has been completed except for plant establishment work and other bid items specified to be performed until Contract acceptance, provided that the Contract must not be accepted unless the plant establishment work has been satisfactorily performed for at least the number of working days specified for plant establishment.

If maintenance and protection relief is granted for a completed portion of the work under section 5-1.38, Type 2 plant establishment period for the completed portion of the work is the time between

completion of all planting work except for plant establishment work, and the granting of maintenance and protection relief, provided that the relief must not be granted unless the plant establishment work in the completed portion of the work has been satisfactorily performed for at least the number of working days specified for the plant establishment period.

20-4.01C Submittals

20-4.01C(1) General

Submit seasonal watering schedules for use during the plant establishment period within 10 days after the start of the plant establishment period. Remote irrigation control system watering schedule must utilize the remote irrigation control system software program.

Submit updated watering schedules within 5 business days after any changes have been made to the authorized schedules.

Submit a revised watering schedule for each irrigation controller not less than 30 days before completion of the plant establishment period.

20-4.01C(2) Notification

The Engineer will notify you in writing when the plant establishment period begins and will furnish statements regarding the number of working days credited to the plant establishment period after the notification.

Notify the Engineer at least 5 business days before applying each application of fertilizer.

20-4.01D Quality Control and Assurance

Provide training by a qualified person on the use and adjustment of the irrigation controllers installed, 30 days before completion of the plant establishment period.

Perform a final inspection of the plant establishment work in the presence of the Engineer between 20 and 30 days before Contract acceptance.

20-4.02 MATERIALS

20-4.02A General

Reserved

20-4.02B Fertilizers

Fertilizer must comply with section 20-3.01B(5).

20-4.03 CONSTRUCTION

20-4.03A General

Remove trash and debris.

Surplus earth accumulated in roadside clearing and planting areas must be removed.

Trim and mow turf areas as specified for sod in section 20-3.03C(3)(e). Dispose of trimmed and mowed material.

If irregular or uneven areas appear within turf areas, restore to a smooth and even appearance. Reseed turf seed areas.

Remove the tops of foliage protectors if plants become restricted.

Remove foliage protectors, including support stakes, within 30 days before the completion of the plant establishment period.

Keep plant basin walls well formed.

Clean new wye strainers and existing wye strainers that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

Remove, clean, and reinstall new filters and existing filters that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

20-4.03B Plant Growth Control

Prune plants planted as part of the Contract as authorized.

Remove plant growth that extends within 2 feet of sidewalks, curbs, dikes, shoulders, walls or fences.

Remove proposed and existing ground cover from within the plant basins, including basin walls, turf areas, and planting areas within edging.

Vines next to walls and fences must be kept staked and tied. Train vines on fences and walls or through cored holes in walls.

20-4.03C Fertilizers

Apply fertilizer to the plants as specified and water into the soil after each application.

Apply fertilizer at the rates shown and spread with a mechanical spreader, whenever possible.

20-4.03D Weed Control

Control weeds under section 20-1.03C(3).

20-4.03E Plant Staking

Replace the plant stakes that are inadequate to support plants with larger stakes.

Remove plant stakes when the Engineer determines they are no longer needed.

20-4.03F Replacement Plants

Replacement plants must comply with section 20-3.01C(4).

Replacement of plants up to and including the 125th plant establishment working day must be with a plant of the same size as originally specified. Plants of a larger container size than those originally specified for replacement plants may be used during the first 125 working days of the plant establishment period.

Replacement of plants after the 125th plant establishment working day must comply with the following size requirements:

Plant size (Original)	Plant size (Replacement)
Pot/liner/plug/seedling	No. 1 container
No. 1 container	No. 5 container
No. 5 container	No. 15 container

Other replacement plants must be the same size as originally specified.

Replacement ground cover plants must comply with the following spacing requirements:

Original spacing (inches)	On center spacing of replacement ground cover plants (inches)		
	Number of completed plant establishment working days		
	1-125	126-190	191-End of plant establishment period
9	9	6	6
12	12	9	6
18	18	12	9
24	24	18	12
36	36	24	18

20-4.03G Watering

Operate the electric automatic irrigation systems in the automatic mode unless authorized.

If any component of the electric automatic irrigation system is operated manually, the day will not be credited as a plant establishment working day unless the manual operation is authorized.

Water plants utilizing the remote irrigation control system software program unless authorized.

Implement the watering schedule at least 10 days before completion of the plant establishment period.

20-4.04 PAYMENT

Not Used

20-5 LANDSCAPE ELEMENTS

20-5.01 GENERAL

20-5.01A General

Section 20-5 includes specifications for constructing and installing landscape elements.

20-5.01B Materials

Not Used

20-5.01C Construction

Earthwork must comply with section 19.

20-5.01D Payment

Not Used

20-5.02 EDGING

20-5.02A General

Section 20-5.02 includes specifications for constructing landscape edging.

20-5.02B Materials

20-5.02B(1) General

Reserved

20-5.02B(2) Header Board Edging

Lumber for header board edging must be one of the following types:

1. Construction grade cedar
2. Pressure-treated Douglas fir
3. Construction heart grade redwood complying with section 57-2.01B(2)

Lumber must be:

1. Rough cut from sound timber.
2. Straight. Sweep must not exceed 1 inch in 6 feet.
3. Free from loose or unsound knots. Knots must be sound, tight, well spaced, and not to exceed 2 inches in size on any face.
4. Free of shakes in excess of 1/3 the thickness of the lumber.
5. Free of splits longer than the thickness of the lumber.
6. Free of other defects that would render the lumber unfit structurally for the purpose intended.

Edging anchors for header board edging must be stakes of the size and shape shown.

20-5.02B(3) Metal Edging

Metal edging must be commercial quality, made of aluminum or steel, and have an L-shaped design. Edging must be a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for the use intended.

Edging anchors must be from the same manufacturer as the metal edging.

20-5.02B(4) High Density Polyethylene Edging

HDPE edging must be commercial quality and a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for commercial installation for the use intended.

Edging anchors must be from the same manufacturer as HDPE edging.

20-5.02B(5) Concrete Edging

Concrete for edging must be minor concrete.

20-5.02B(6)–20-5.02B(10) Reserved

20-5.02C Construction

20-5.02C(1) General

Where edging is used to delineate the limits of inert ground cover or mulch areas, install edging before installing inert ground cover or mulch areas.

Saw cut surfaces where (1) asphalt concrete or concrete surfacing must be removed to permit the installation of edging and (2) no joint exists between the surfacing to be removed and the surfacing to remain in place. The surfacing must be cut in a straight line to a minimum depth of 2 inches with a power-driven saw before the surfacing is removed. Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

20-5.02C(2) Header Board Edging

Each stake must be driven flush with the top edge of the header board edging and the stake top must be beveled away from the header board at a 45 degree angle. Attach stake to header board with a minimum of two 12-penny hot dipped galvanized nails per stake.

20-5.02C(3) Metal and High Density Polyethylene Edging

Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

20-5.02C(4) Concrete Edging

Construct and finish minor concrete edging under section 73-2.

20-5.02C(5)–20-5.02C(9) Reserved

20-5.02D Payment

Edging is measured parallel to the ground surface.

20-5.03 INERT GROUND COVERS AND MULCHES

20-5.03A General

20-5.03A(1) General

20-5.03A(1)(a) Summary

Section 20-5.03 includes specifications for installing inert ground covers and mulches.

20-5.03A(1)(b) Definitions

Reserved

20-5.03A(1)(c) Submittals

Submit:

1. Filter fabric product data including the manufacturer's product sheet and installation instructions
2. Certificate of compliance for filter fabric at least 5 business days before delivery of the material to the job site

20-5.03A(1)(d) Quality Control and Assurance

Reserved

20-5.03A(2) Materials

Soil sterilant must be oxadiazon granular preemergent and must comply with section 20-1.02C.

Filter fabric must be Class A. Staples for filter fabric must comply with section 21-1.02R.

20-5.03A(3) Construction

20-5.03A(3)(a) General

Before performing inert ground cover and mulch work, remove plants and weeds to ground level.

20-5.03A(3)(b) Earthwork

Excavate areas to receive inert ground cover or mulch to the depth shown. Maintain the planned flow lines, slope gradients, and contours of the job site. Grade subgrade to a smooth and uniform surface and compact to not less than 90 percent relative compaction.

20-5.03A(3)(c) Treatment of Soil

After compaction, apply soil sterilant at the maximum label rate. Do not apply soil sterilant more than 12 inches beyond the inert ground cover or mulch limits. The soil sterilant application and inert ground cover or mulch placement must be completed within the same work day.

20-5.03A(3)(d) Filter Fabric

Immediately before placing filter fabric, surfaces to receive filter fabric must be free of loose or extraneous material and sharp objects that may damage the filter fabric during installation.

Align fabric and place in a wrinkle-free manner.

Overlap adjacent rolls of the fabric from 12 to 18 inches. Spread each overlapping roll in the same direction. Fasten fabric with staples flush with the adjacent fabric to prevent movement of fabric by placement of inert ground cover or mulch.

Repair or replace fabric damaged during placement of inert ground cover or mulch with sufficient fabric to comply with overlap requirements.

20-5.03A(4) Payment

Not Used

20-5.03B Rock Blanket

20-5.03B(1) General

20-5.03B(1)(a) Summary

Section 20-5.03B includes specifications for placing rock blanket.

20-5.03B(1)(b) Definitions

Reserved

20-5.03B(1)(c) Submittals

Submit a 1 sq yd sample of the various rock sizes.

20-5.03B(1)(d) Quality Control and Assurance

Reserved

20-5.03B(2) Materials

20-5.03B(2)(a) General

Do not use filter fabric.

20-5.03B(2)(b) Concrete

Concrete must be minor concrete.

20-5.03B(2)(c) Rock

Rock must be clean, smooth, and obtained from a single source and must comply with the following grading requirements:

Grading Requirements

Screen size (inches)	Percentage passing
8	100
6	50-85
4	0-50

20-5.03B(2)(d) Mortar

Mortar must comply with section 51-1.02F.

20-5.03B(3) Construction

Place concrete as shown.

Rock must be placed while concrete is still plastic. Remove concrete adhering to the exposed surfaces of the rock.

Loose rocks or rocks with a gap greater than 3/8 inch must be reset by an authorized method. The rock gap is measured from the edge of the rock to the surrounding concrete bedding.

Place mortar as shown.

20-5.03B(4) Payment

Rock blanket is measured parallel to the rock blanket surface.

20-5.03C Gravel Mulch

20-5.03C(1) General

20-5.03C(1)(a) Summary

Section 20-5.03C includes specifications for placing gravel mulch.

20-5.03C(1)(b) Definitions

Reserved

20-5.03C(1)(c) Submittals

Submit a 5-lb sample of the gravel mulch.

20-5.03C(1)(d) Quality Control and Assurance

Reserved

20-5.03C(2) Materials

Gravel mulch must be:

1. Uniform gray color
2. From a single source only
3. Crushed rock that complies with the following grading requirements:

Grading Requirements

Sieve size	Percent passing
1-1/4 inch	100
3/4 inch	60-80
1/2 inch	45-65
No. 40	5-20

20-5.03C(3) Construction

Place gravel and compact by rolling.

The finished gravel mulch surface must be smooth and uniform, maintaining original flow lines, slope gradients, and contours of the job site.

20-5.03C(4) Payment

Gravel mulch is measured parallel to the gravel mulch surface.

20-5.03D Decomposed Granite

20-5.03D(1) General

20-5.03D(1)(a) Summary

Section 20-5.03D includes specifications for placing decomposed granite.

20-5.03D(1)(b) Definitions

Reserved

20-5.03D(1)(c) Submittals

Five business days before delivery of the materials to the job site, submit:

1. Solidifying emulsion product data including the manufacturers' product sheets and installation instructions
2. Certificate of compliance for solidifying emulsion
3. 5-lb sample of the decomposed granite

20-5.03D(1)(d) Quality Control and Assurance

Test plot must be:

1. Constructed at an authorized location
2. At least 3 by 12 feet
3. Constructed using the materials, equipment, and methods to be used in the work
4. Authorized before starting work

Notify the Engineer not less than 7 days before constructing the test plot.

The Engineer uses the authorized test plot to determine acceptability of the work.

If ordered, prepare additional test plots. Additional test plots are change order work.

If the test plot is not incorporated into the work, the Engineer may order you to remove it.

20-5.03D(2) Materials

20-5.03D(2)(a) General

Decomposed granite must be:

1. Uniform gray or tan color
2. From one source only
3. Crushed granite rock that complies with grading requirements shown in the following table:

Grading Requirements

Sieve size	Percent passing
3/8 inch	100
No. 4	95-100
No. 8	75-80
No. 16	55-65
No. 30	40-50
No. 50	25-35
No. 100	20-25
No. 200	5-15

Note:

Grading based upon AASHTO T11-82 and T27-82

20-5.03D(2)(b) Solidifying Emulsion

Solidifying emulsion must be either a water-based polymer or nontoxic organic powdered binder specifically manufactured to harden decomposed granite. The solidifying emulsion must not alter the decomposed granite color.

20-5.03D(3) Construction

Do not place decomposed granite during rainy conditions.

Mix solidifying emulsion thoroughly and uniformly throughout the decomposed granite and under the manufacturer's instructions. Mix the material in the field using portable mixing equipment, or delivered in mixer trucks from a local ready-mixed plant.

Place decomposed granite uniformly in layers no more than 1-1/2 inch thick. Compact each layer of decomposed granite to a relative compaction of not less than 90 percent. Begin compaction within 6 to 48 hours of placement.

If the material was mixed in the field, apply an application of solidifying emulsion after compaction as recommended by the manufacturer. Prevent runoff or overspray of solidifying emulsion onto adjacent paved or planting areas.

The finished decomposed granite surface must be smooth and uniform, compacted to a relative compaction of not less than 90 percent, maintaining original flow lines, slope gradients, and contours of the job site.

20-5.03D(4) Payment

Not Used

20-5.03E Wood Mulch

20-5.03E(1) General

20-5.03E(1)(a) Summary

Section 20-5.03E includes specifications for placing wood mulch.

20-5.03E(1)(b) Definitions

Reserved

20-5.03E(1)(c) Submittals

Submit a certificate of compliance for mulch.

Submit a 2 cu ft mulch sample with the mulch source listed on the bag and obtain approval before delivery of mulch to the job site.

20-5.03E(1)(d) Quality Control and Assurance

Reserved

20-5.03E(2) Materials

20-5.03E(2)(a) General

Mulch must not contain more than 0.1 percent of deleterious materials such as rocks, glass, plastics, metals, clods, weeds, weed seeds, coarse objects, sticks larger than the specified particle size, salts, paint, petroleum products, pesticides or other chemical residues harmful to plant or animal life.

Do not use filter fabric.

20-5.03E(2)(b) Tree Bark Mulch

Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.

Tree bark mulch must be ground so that at least 95 percent of the material by volume is less than 2 inches and no more than 30 percent by volume is less than 1 inch.

20-5.03E(2)(c) Wood Chip Mulch

Wood chip mulch must:

1. Be derived from clean wood
2. Not contain leaves or small twigs
3. Contain at least 95 percent wood chips by volume with average thickness of 1/16 to 3/8 inch in any direction and 1/2 to 3 inches in length

20-5.03E(2)(d) Shredded Bark Mulch

Shredded bark mulch must:

1. Be derived from trees
2. Be a blend of loose, long, thin wood, or bark pieces
3. Contain at least 95 percent wood strands by volume with average thickness of 1/8 to 1-1/2 inches in any direction and 2 to 8 inches in length

20-5.03E(2)(e) Tree Trimming Mulch

Tree trimming mulch must:

1. Be derived from chipped trees and may contain leaves and small twigs.
2. Contain at least 95 percent material by volume less than 3 inches and no more than 30 percent by volume less than 1 inch

20-5.03E(2)(f)–20-5.03E(2)(j) Reserved

20-5.03E(3) Construction

Spread mulch placed in areas outside of plant basins to a uniform thickness as shown.

Mulch must be placed at the rate described and placed in the plant basins or spread in areas as shown after the plants have been planted. Mulch placed in plant basins must not come in contact with the plant crown and stem.

Spread mulch from the outside edge of the proposed plant basin or plant without basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the proposed plant or plant without basin is 12 feet or more from the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings, spread the mulch 6 feet beyond the outside edge of the proposed plant basin or plant without basin.

Do not place mulch within 4 feet of:

1. Flow line of earthen drainage ditches
2. Edge of paved ditches
3. Drainage flow lines

20-5.03E(4) Payment

Mulch is measured in the vehicle at the point of delivery.

Replace the paragraph in section 21-1.02P with:

10-19-12

Fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Fiber roll must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end and must be one of the following:

- 1. 8 to 10 inches in diameter and at least 1.1 lb/ft
- 2. 10 to 12 inches in diameter and at least 3 lb/ft

Fiber roll must have a minimum functional longevity of 1 year.

Add between the 1st and 2nd paragraphs of section 21-1.03A:

01-18-13

Remove and dispose of trash, debris, and weeds in areas to receive erosion control materials.

Remove and dispose of loose rocks larger than 2-1/2 inches in maximum dimension unless otherwise authorized.

Protect the traveled way, sidewalks, lined drainage channels, and existing vegetation from overspray of hydraulically-applied material.

Replace section 21-1.03B with:

01-18-13

21-1.03B Reserved

Replace "3 passes" in item 2 in the list in the 2nd paragraph of section 21-1.03G with:

04-19-13

2 passes

Replace section 21-1.03I with:

04-20-12

21-1.03I Reserved

Add between the 4th and 5th paragraphs of section 21-1.03P:

10-19-12

If soil conditions do not permit driving the stakes into the soil, drill pilot holes to facilitate driving of the stakes.

Delete the 1st and 2nd sentences of the 3rd paragraph in section 21-1.04.

01-18-13

28 CONCRETE BASES

11-15-13

Replace "Reserved" in section 28-1 with:

07-19-13

Section 28 includes specifications for constructing new concrete base and replacing existing base.

Replace section 28-2 with:

07-19-13

28-2 LEAN CONCRETE BASE

28-2.01 GENERAL

28-2.01A Summary

Section 28-2 includes specifications for constructing lean concrete base (LCB).

28-2.01B Definitions

coarse aggregate: Aggregate retained on a no. 4 sieve.

fine aggregate: Aggregate passing a no. 4 sieve.

28-2.01C Submittals

28-2.01C(1) General

At least 25 days before field qualification, submit the name of your proposed testing laboratory.

At least 10 days before field qualification, submit:

1. Aggregate qualification test results
2. Proposed aggregate gradation
3. Mix design, including:
 - 3.1. Proportions
 - 3.2. Types and amounts of chemical admixtures
4. Optional notice stating intent to produce LCB qualifying for a transverse contraction joint waiver under section 28-2.03D

Submittals for cementitious material must comply with section 90-1.01C(3).

Submit QC test results within 24 hours of test completion.

28-2.01C(2) Field Qualification

For each field qualification for each mix design, manufacture 12 specimens under ASTM C 31 and submit six of the specimens from 24 to 72 hours after manufacture. Use one batch for all 12 specimens.

11-15-13

Submit field qualification data and test reports including:

07-19-13

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cu yd, the minimum is 5 cu yd
4. Type and source of ingredients used
5. Age and strength from compression strength results

Field qualification test reports must be signed by the official in responsible charge of the laboratory performing the tests.

28-2.01D Quality Control and Assurance

28-2.01D(1) General

Stop LCB activities and immediately notify the Engineer whenever:

1. Any quality control or acceptance test result does not comply with the specifications
2. Visual inspection shows noncompliant LCB

If LCB activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant LCB

3. Obtain authorization

Molds for compressive strength testing under ASTM C 31 or ASTM C 192 must be 6 by 12 inches.

Quality control and assurance for cementitious materials and admixtures must comply with section 90-1.01D(1)

28-2.01D(2) Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. Qualification tests include (1) sand equivalent and (2) average 7-day compressive strength under ASTM C 39 on 3 specimens manufactured under ASTM C 192. The cement content for this test must be 300 lb/cu yd, and the 7-day average compressive strength must be at least 610 psi. Cement must be Type II portland cement under section 90-1.02B(2).

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

28-2.01D(3) Field Qualification Testing

Before placing LCB, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to authorized mixed designs.

Proposed mix designs must be field qualified before you place the LCB represented by those mix designs. Use an American Concrete Institute (ACI) certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized by the Engineer.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Quality Control Requirements."

Field qualification testing for compressive strength must comply with the following:

1. Manufacture 12 cylinders under ASTM C 31 from a single batch
2. Perform 3 tests; each test consists of determining the average compressive strength of 2 cylinders at 7 days under ASTM C 39
3. The average compressive strength for each test must be at least 530 psi

If you submitted a notice to produce LCB qualifying for a transverse contraction joint waiver, manufacture additional specimens and test LCB for compressive strength at 3 days. Prepare compressive strength cylinders under ASTM C 31 at the same time using the same material and procedures as the 7-day compressive strength cylinders except do not submit 6 additional test cylinders. The average 3-day compressive strength for each test must be not more than 500 psi.

28-2.01D(4) Quality Control Testing

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

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

Perform quality control sampling, testing, and inspection throughout LCB production and placement. LCB must comply with the requirements for the quality characteristics shown in the following table:

Quality Control Requirements

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement
Sand equivalent (min)	ASTM D 2419	1 per 500 cubic yards but at least 1 per day of production	18
Aggregate gradation	ASTM C 136		Note a
Air content (max, percent) ^b	ASTM C 231		4
Penetration (inches)	ASTM C 360		0 to 1-1/2 nominal ^{c, d}
Slump (inches)	ASTM C 143		0-3 nominal ^{c, d}
Compressive strength (min, psi at 7 days)	ASTM C 39 ^e		530
Compressive strength (max, psi at 3 days) ^f	ASTM C 39 ^e		500

^a Comply with the table titled "Aggregate Grading" in section 28-2.02C.

^b If no single test in the first 5 air content tests exceeds 1-1/2 percent, no further air content tests are required.

^c Maximum penetration must not exceed 2 inches and maximum slump must not exceed 4 inches

^d Test for either penetration or slump

^e Prepare cylinders under ASTM C 31

^f Only applicable if you (1) submitted a notice stating intent to produce LCB qualifying for a transverse contraction joint waiver and (2) successfully field qualified the LCB for 3-day compressive strength. Make cylinders at the same time using the same material and procedures as QC testing for 7-day compressive strength.

28-2.01D(5) Acceptance Criteria

For acceptance, properties of LCB must comply with values shown in the following table:

Acceptance Criteria Testing

Property	Test method	Value
Compressive strength (min, psi at 7 days)	ASTM C 39 ^a	530 ^b

^a Cylinders prepared under ASTM C 31

^b A compressive strength test represents up to (1) 1,000 cu yd or (2) 1 day's production if less than 1,000 cu yd.

28-2.02 MATERIALS

28-2.02A General

Water must comply with section 90-1.02D.

The air content in LCB must not exceed 4 percent. If the aggregate used for LCB is produced from processed reclaimed asphalt concrete or other material that may cause the air content to exceed 4 percent, reduce the air content with an admixture.

A water-reducing chemical admixture may be used. Water-reducing chemical admixture must comply with ASTM C 494, Type A or Type F.

Air-entraining admixtures must comply with section 90-1.02E.

28-2.02B Cementitious Material

Portland cement must comply with section 90-1.02B. Portland cement content must not exceed 300 lb/cu yd.

SCM must comply with section 90-1.02B except the equations for SCM content under 90-1.02B(3) do not apply.

For aggregate qualification testing, use Type II portland cement under section 90-1.02B(2) without SCM.

28-2.02C Aggregate

Aggregate must be clean and free from decomposed material, organic material, and other deleterious substances. Aggregate samples must not be treated with lime, cement, or chemicals before testing for sand equivalent.

Use either 1-1/2 inch or 1 inch grading. Do not change your selected aggregate grading without authorization.

When tested under ASTM C 136, the percentage composition by weight of the aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Sieve sizes	Aggregate Grading			
	Percentage passing			
	1-1/2" maximum		1" maximum	
	Operating range	Contract compliance	Operating range	Contract compliance
2"	100	100	--	--
1-1/2"	90-100	87-100	100	100
1"	--	--	90-100	87-100
3/4"	50-85	45-90	50-100	45-100
3/8"	40-75	35-80	40-75	35-80
No. 4	25-60	20-65	35-60	30-65
No. 30	10-30	6-34	10-30	6-34
No. 200	0-12	0-15	0-12	0-15

Aggregate must comply with the quality requirements shown in the following table:

Aggregate Quality			
Property	Test Method	Operating range	Contract compliance
Sand equivalent (min)	ASTM D 2419	21	18
Compressive strength (min, psi at 7 days)	ASTM C 192 ASTM C 39	--	610 at 300 lb/cu yd cement content

Note: Cement must be Type II portland cement under section 90-1.02B(2).

If the aggregate grading or the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing LCB for the remainder of the work day. Do not place additional LCB until you demonstrate the LCB to be placed complies with the operating range requirements.

28-2.03 CONSTRUCTION

28-2.03A General

Do not allow traffic or equipment on the LCB for at least 72 hours after the 1st application of the curing compound and completion of contraction joints. Limit traffic and equipment on the LCB to that is required for placing additional layers of LCB or paving.

28-2.03B Subgrade

Immediately before spreading LCB, the subgrade must:

1. Comply with the specified compaction and elevation tolerance for the material involved
2. Be free from loose or extraneous material
3. Be uniformly moist

Areas of subgrade lower than the grade established by the Engineer must be filled with LCB. The Department does not pay for filling low areas of subgrade.

28-2.03C Proportioning, Mixing, and Transporting

Proportion LCB under section 90-1.02F except aggregate does not have to be separated into sizes.

Mix and transport LCB under section 90-1.02G except the 5th and 7th paragraphs in section 90-1.02G(6) do not apply.

28-2.03D Placing

Place LCB under section 40-1.03H(1) except the 3rd paragraph does not apply.

Unless otherwise described, construct LCB in minimum widths of 12 feet separated by construction joints. For LCB constructed monolithically in widths greater than 26 feet, construct a longitudinal contraction joint offset no more than 3 feet from the centerline of the width being constructed.

Contraction joints must comply with section 40-1.03D(3).

Construct transverse contraction joints in intervals that result in LCB areas where the lengths and widths are within 20 percent of each other. Measure the widths from any longitudinal construction or longitudinal contraction joints.

The Engineer waives the requirement for transverse contraction joints if you:

1. Submitted a notice under 28-2.01C(1)
2. Successfully field qualified LCB for 3-day compressive strength testing
3. Submit QC test results for 3-day compressive strength under section 28-2.01D(4).

If concrete pavement will be placed on LCB, construct longitudinal construction and longitudinal contraction joints in the LCB. Provide at least 1 foot horizontal clearance from planned longitudinal construction and longitudinal contraction joints in the concrete pavement.

Do not mix or place LCB when the atmospheric temperature is below 35 degrees F. Do not place LCB on frozen ground.

28-2.03E Finishing

Place LCB under section 40-1.03H(4) or under section 40-1.03H(5) except where there are confined work areas and when authorized:

1. Spread and shape LCB using suitable powered finishing machines and supplement with hand work as necessary
2. Consolidate LCB using high-frequency internal vibrators within 15 minutes after LCB is deposited on the subgrade
3. Vibrate with care such that adequate consolidation occurs across the full paving width and do not use vibrators for extensive weight shifting of the LCB

For LCB to be paved with HMA, before curing operation texture the LCB finished surface by dragging a broom, burlap, or a spring steel tine device. If using a spring steel tine device, the device must produce a scored surface with scores parallel or transverse to the pavement centerline. Texture at a time and in a manner that produces the coarsest texture for the method used.

For LCB to be paved with HMA, the finished surface must not vary more than 0.05 foot from the grade established by the Engineer.

Do not texture LCB that will be covered with concrete pavement. Before applying curing compound, finish LCB to a smooth surface free from mortar ridges and other projections.

For LCB to be paved with concrete pavement, the finished surface must not be above the grade, or more than 0.05 foot below the grade established by the Engineer.

The finished surface must be free from porous areas.

28-2.03F Curing

After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03K except for LCB to be paved with concrete pavement, comply with section 36-2. Apply curing compound to the area to be paved with concrete pavement:

1. In 2 separate applications
2. Before the atmospheric temperature falls below 40 degrees F

37 BITUMINOUS SEALS

03-21-14

Replace section 37-1.01 with:

01-18-13

37-1.01 GENERAL

37-1.01A Summary

Section 37-1 includes general specifications for applying bituminous seals.

37-1.01B Definitions

Reserved

37-1.01C Submittals

Reserved

37-1.01D Quality Control and Assurance

37-1.01D(1) General

Reserved

37-1.01D(2) Prepaving Conference

For seal coats and micro-surfacing, schedule a prepaving conference at a mutually agreed upon time and place to meet with the Engineer.

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

1. Project superintendent
2. Paving construction foreman
3. Traffic control foreman

Be prepared to discuss:

1. Quality control
2. Acceptance testing
3. Placement
4. Training on placement methods
5. Checklist of items for proper placement
6. Unique issues specific to the project, including:
 - 6.1. Weather
 - 6.2. Alignment and geometrics
 - 6.3. Traffic control issues
 - 6.4. Haul distances
 - 6.5. Presence and absence of shaded areas
 - 6.6. Any other local issues

37-1.02 MATERIALS

Not Used

37-1.03 CONSTRUCTION

Not Used

37-1.04 PAYMENT

Not Used

Replace section 37-2 with:

07-19-13

37-2 SEAL COATS

37-2.01 GENERAL

37-2.01A General

37-2.01A(1) Summary

Section 37-2 includes specifications for applying seal coats.

37-2.01A(2) Definitions

Reserved

37-2.01A(3) Submittals

Reserved

37-2.01A(4) Quality Control and Assurance

The following personnel must attend the prepaving conference:

1. Aggregate suppliers
2. Chip spreader operators
3. Emulsion and binder distributor
4. Coated chips producer if coated chips are used

37-2.01B Materials

Screenings must be broken stone, crushed gravel, or both. At least 90 percent of screenings by weight must be crushed particles as determined under California Test 205.

Screenings for seal coats must have the properties specified in the following table:

Seal Coat Screenings

Properties	Test method	Specification
Los Angeles Rattler, %, max	California Test	
Loss at 100 revolutions.	211	10
Loss at 500 revolutions.		40
Film stripping, %, max	California Test	25
	302	

37-2.01C Construction

37-2.01C(1) General

Wherever final sweeping or brooming of the seal coat 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 seal coat work completed that has not received permanent traffic stripes and pavement markings.

37-2.01C(2) Equipment

Equipment for seal coats must include and comply with the following:

1. Screenings haul trucks. Haul trucks must have:
 - 1.1. Tailgates that discharge screenings
 - 1.2. Devices to lock onto the rear screenings spreader hitch
 - 1.3. Dump beds that will not push down on the spreader when fully raised
 - 1.4. Dump beds that will not spill screenings on the roadway when transferred to the spreader hopper
 - 1.5. Tarpaulins to cover precoated screenings when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
2. Self-propelled screenings spreader. The spreader must have:
 - 2.1. Screenings hopper in the rear

- 2.2. Belt conveyors that carry the screenings to the front
- 2.3. Spreading hopper capable of providing a uniform screening spread rate over the entire width of the traffic lane in 1 application.
3. Self-propelled power brooms. Do not use gutter brooms or steel-tined brooms. Brooms must be capable of removing loose screenings adjacent to barriers that prevent screenings from being swept off the roadway, including curbs, gutters, dikes, berms, and railings.
4. Pneumatic-tired rollers. Pneumatic-tired rollers must be an oscillating type at least 4 feet wide. Each roller must be self-propelled and reversible. Pneumatic tires must be of equal size, diameter, type, and ply. The roller must carry at least 3,000 lb of load on each wheel and each tire must have an air pressure of 100 ± 5 psi.

37-2.01C(3) Surface Preparation

Before applying seal coat, 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 a sufficient number of control points to relocate the facilities after the application of the seal coat.

After completion of the seal coat operation, remove covers from the facilities.

Immediately before applying seal coat, clean the surface to receive seal coat by removing extraneous material and drying. Cleaning the existing pavement includes the use of brooms.

37-2.01C(4) Applying Emulsion and Asphalt Binder

Prevent spray on existing pavement not intended for seal coat or on previously applied seal coat using a material such as building paper. Remove the material after use.

Align longitudinal joints between seal coat applications with designated traffic lanes.

For emulsion, 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 the emulsion with a squeegee or other authorized means. For asphalt binder, hand spray nonaccessible areas. You may overlap the emulsion or asphalt binder applications before the application of screenings at longitudinal joints.

Do not apply the emulsion or asphalt binder unless there are sufficient screenings at the job site to cover the emulsion or asphalt binder.

Discontinue application of emulsion or asphalt binder early enough to comply with lane closure specifications and darkness. Apply to 1 lane at a time and cover the lane entirely in 1 operation.

37-2.01C(5) Spreading Screenings

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading screenings.

Spread screenings at a uniform rate over the full lane width in 1 application.

Broom excess screenings at joints before spreading adjacent screenings.

Operate the spreader at speeds slow enough to prevent screenings from rolling over after dropping.

If the spreader is not moving, screenings must not drop. If you stop spreading and screenings drop, remove the excess screenings before resuming activities.

37-2.01C(6) Finishing

Remove piles, ridges, or unevenly distributed screenings. Repair permanent ridges, bumps, or depressions in the finished surface. Spread additional screenings and roll if screenings are picked up by rollers or vehicles.

Seal coat joints between adjacent applications of seal coat must be smooth, straight, uniform, and completely covered. Longitudinal joints must be at lane lines and not overlap by more than 4 inches. Blend the adjacent applications by brooming.

A coverage is the number of passes a roller needs to cover the width. A pass is 1 roller movement parallel to the seal coat 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 coverage until completing the previous coverage.

Before opening to traffic, finish seal coat in the following sequence:

1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
2. Perform final rolling consisting of 3 coverages with a pneumatic-tired roller
3. Broom excess screenings from the roadway and adjacent abutting areas
4. Apply flush coat if specified

The Engineer may order salvaging of excess screenings.

Dispose of excess screenings the Engineer determines are not salvageable. Dispose of screenings in any of the following ways or locations:

1. Under section 14-10
2. On embankment slopes
3. In authorized areas

Salvaging and stockpiling excess screenings is change order work.

37-2.01C(7) Seal Coat Maintenance

Seals coat surfaces must be maintained for 4 consecutive days from the day screenings are applied. Maintenance must include brooming to maintain a surface free of loose screenings, to distribute screenings over the surface so as to absorb any free asphaltic material, to cover any areas deficient in cover coat material, and to prevent formation of corrugations.

After 4 consecutive days, excess screenings must be removed from the paved areas. Brooming must not displace screenings set in asphaltic material.

The exact time of brooming will be determined by the Engineer. As a minimum, brooming will be 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 seal coat
2. On multilane roadways, from 2 to 4 hours after screenings have been placed
3. In addition to previous brooming, immediately before opening any lane to public traffic, not controlled with pilot cars
4. On the morning following the application of screenings on any lane that has been open to public traffic not controlled with pilot cars and before starting any other activities

For 2-lane 2-way roadways under 1-way traffic control, upon completion of secondary rolling, public traffic must be controlled with pilot cars and routed over the new seal coat for a period of 2 to 4 hours. The Engineer will determine the exact period of time.

Schedule the operations so that seal coat is placed on both lanes of the traveled way each work shift and so that 1-way traffic control is discontinued 1 hour before darkness. At the end of the work shift, the end of the seal coat on both lanes must generally match.

On multilane roadways, initial brooming must begin after the screenings have been in place for a period of 2 to 4 hours. If the initial brooming is not completed during the work shift in which the screenings were placed, the initial brooming must be completed at the beginning of the next work shift.

Public traffic must be controlled with pilot cars and be routed on the new seal coat surface of the lane for a minimum of 2 hours after completion of the initial brooming and before opening the lane to traffic not controlled with pilot cars. When traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to public traffic. Once traffic controlled with pilot cars is routed over the seal coat at a particular location, continuous control must be maintained at that location until the seal coat placement and brooming on adjacent lanes to receive seal coat is completed.

37-2.01D Payment

If there is no bid item for a traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the seal coat.

If test results for the screenings grading do not comply with specifications, you may remove the seal coat represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the screenings represented by the test results.

37-2.02 FOG SEAL

37-2.02A General

37-2.02A(1) Summary

Fog seal coat includes applying a slow-setting asphaltic emulsion.

37-2.02A(2) Definitions

Reserved

37-2.02A(3) Submittals

Submit a 1/2-gallon sample of the asphaltic emulsion in a plastic container. Take the sample from the distributor truck spray bar at mid-load.

37-2.02A(4) Quality Control and Assurance

Reserved

37-2.02B Material

The Engineer selects the grade of slow-setting asphaltic emulsion to be used.

If additional water is added to the asphaltic emulsion, the resultant mixture must not be more than 1 part asphaltic emulsion to 1 part water. The Engineer determines the exact amount of additional water.

37-2.02C Construction

Apply asphaltic emulsion for fog seal coat at a residual asphalt rate from 0.02 to 0.06 gal/sq yd. The Engineer determines the exact rate.

Apply fog seal coat when the ambient air temperature is above 40 degrees F.

Sprinkle water on fog seal coat that becomes tacky in an amount determined by the Engineer.

If fog seal coat and seal coat with screenings are specified on the same project, apply fog seal coat at least 4 days before applying the adjoining seal coat with screenings. The joint between the seal coats must be neat and uniform.

37-2.02D Payment

The Department does not adjust the unit price for an increase or decrease in the asphaltic emulsion (fog seal coat) quantity.

37-2.03 FLUSH COATS

37-2.03A General

Flush coat includes applying a fog seal coat to the surface, followed by sand.

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37-2.03B Material

The Engineer selects the grade of slow-setting or quick-setting asphaltic emulsion to be used.

Sand for flush coat must comply with the material specifications for fine aggregate grading in section 90-1.02C(3). Sand must not include organic material or clay.

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37-2.03C Construction

Apply asphaltic emulsion for flush coat at a residual asphalt rate from 0.02 to 0.06 gal/sq yd. The Engineer determines the exact rate.

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after the asphaltic emulsion application.

Spread sand with a self-propelled screenings spreader equipped 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. The Engineer determines the exact rate.

37-2.03D Payment

The Department does not adjust the unit price for an increase or decrease in the sand cover for the flush coat quantity.

37-2.04 ASPHALTIC EMULSION SEAL COAT

37-2.04A General

37-2.04A(1) General

37-2.04A(1)(a) Summary

Section 37-2.04 includes specifications for applying asphaltic emulsion seal coat. Asphaltic emulsion seal coat includes applying asphaltic emulsion, followed by screenings, and then a flush coat.

Asphaltic emulsion seal coat includes one or more of the following types:

1. Nonpolymer asphaltic emulsion seal coat
2. Polymer asphaltic emulsion seal coat

A double asphaltic emulsion seal coat is the application of asphaltic emulsion, followed by screenings applied twice in sequence.

37-2.04A(1)(b) Definitions

Reserved

37-2.04A(1)(c) Submittals

At least 10 days before starting asphaltic emulsion seal coat application, submit the name of an authorized laboratory that will be performing asphaltic emulsion QC testing.

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Submit a sample of asphaltic emulsion in a 1/2-gallon plastic container to the Engineer and to the authorized laboratory. Each sample must be submitted in an insulated shipping container within 24 hours of sampling.

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Within 7 days after taking samples, submit the authorized laboratory's test results for asphaltic emulsion.

37-2.04A(1)(d) Quality Control and Assurance

Samples for the screenings grading and cleanness value must be taken from the spreader conveyor belt.

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Within 3 business days of sampling, the authorized laboratory must test the asphaltic emulsion for:

1. Viscosity under AASHTO T 59
2. Sieve test under AASHTO T 59
3. Demulsibility under AASHTO T 59
4. Torsional recovery under California Test 332 for polymer asphaltic emulsion
5. Elastic recovery under AASHTO T 301 for polymer asphaltic emulsion

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 1/2-gallon samples every 55 tons or at least 1 day's production.

37-2.04A(2) Materials

Not Used

37-2.04A(3) Construction

The Engineer determines the exact application rate.

At the time of application, the temperature of the asphaltic emulsion must be from 130 to 180 degrees F.

When tested under California Test 339, the application rate for asphaltic emulsion must not vary from the average by more than:

1. 15 percent in the transverse direction
2. 10 percent in the longitudinal direction

37-2.04A(4) Payment

Not Used

37-2.04B Nonpolymer Asphaltic Emulsion Seal Coat**37-2.04B(1) General****37-2.04B(1)(a) Summary**

Section 37-2.04B includes specifications for applying a nonpolymer asphaltic emulsion seal coat.

37-2.04B(1)(b) Definitions

Reserved

37-2.04B(1)(c) Submittals

Reserved

37-2.04B(1)(d) Quality Control and Assurance

For nonpolymer asphaltic emulsion seal coat, if a test result for the screenings cleanness value is from 75 to 80, you may request that the asphaltic emulsion seal coat represented by the test remain in place. A payment deduction is made as specified in section 37-2.04D. If the screenings cleanness value is less than 75, remove the asphaltic emulsion seal coat.

37-2.04B(2) Materials

Screenings for nonpolymer asphaltic emulsion seal coat must have the gradation as determined under California Test 202 in the following table.

**Nonpolymer Asphaltic Emulsion Seal Coat Screenings
Gradation**

Sieve sizes	Percentage passing			
	Coarse 1/2" max	Medium 3/8" max	Medium fine 5/16" max	Fine 1/4" max
3/4"	100	--	--	--
1/2"	95-100	100	--	--
3/8"	50-80	90-100	100	100
No. 4	0-15	5-30	30-60	60-85
No. 8	0-5	0-10	0-15	0-25
No. 16	--	0-5	0-5	0-5
No. 30	--	--	0-3	0-3
No. 200	0-2	0-2	0-2	0-2

The cleanness value determined under California Test 227 must be 80 or greater.

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37-2.04B(3) Construction

Asphaltic emulsion must be applied within the application rate ranges shown in the following table:

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Asphaltic Emulsion Application Rates

Screenings	Application rate range(gallons per square yard)
Fine	0.15–0.30
Medium fine	0.25–0.35
Medium	0.25–0.40
Coarse	0.30–0.40

Apply asphaltic emulsion 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 emulsion when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

For double asphaltic emulsion seal coat, the asphaltic emulsion must be applied within the application rates shown in the following table:

Asphaltic Emulsion Application Rates

Screenings	Application rate range (gal/sq yd)
Double	
1st application	0.20–0.35
2nd application	0.20–0.30

You may stockpile screenings for asphaltic emulsion seal coat if you prevent contamination. Screenings must have damp surfaces at spreading. If water visibly separates from the screenings, do not spread. You may redampen them in the delivery vehicle.

Spread screenings before the asphaltic emulsion sets or breaks.

Spread screenings within 10 percent of the rate determined by the Engineer. Screenings must have a spread rate within the ranges shown in the following table:

Screening Spread Rates

Seal coat type	Range (lb/sq yd)
Fine	12–20
Medium fine	16–25
Medium	20–30
Coarse	23–30

Do not spread screenings more than 2,500 feet ahead of the completed initial rolling.

For double asphaltic emulsion seal coat, screenings must have a spread rate within the ranges shown in the following table:

Screening Spread Rates

Seal coat type	Range (lb/sq yd)
Double	
1st application	23–30
2nd application	12–20

Remove excess screenings on the 1st application before the 2nd application of asphaltic emulsion.

37-2.04B(4) Payment

If asphaltic emulsion seal coat with screenings does not comply with the cleanness value specifications, you may request that the seal coat remain in place with a pay deduction corresponding to the cleanness value shown in the following table:

Asphaltic Emulsion Seal Coat Cleanness Value Deductions

Cleanness value	Deduction
80 or over	None
79	\$2.00 /ton
77-78	\$4.00 /ton
75-76	\$6.00 /ton

37-2.04C Polymer Asphaltic Emulsion Seal Coat

37-2.04C(1) General

37-2.04C(1)(a) Summary

Section 37-2.04C includes specifications for applying a polymer asphaltic emulsion seal coat.

37-2.04C(1)(b) Definitions

Reserved

37-2.04C(1)(c) Submittals

At least 10 days before starting polymer asphaltic emulsion seal coat application, submit a signed copy of the test result report of the Vialit test method for aggregate retention in chip seals (french chip) to the Engineer and to:

DEPARTMENT OF TRANSPORTATION
Division of Maintenance, Roadway Maintenance Office
1120 N Street, MS 31
Sacramento, CA 95814

37-2.04C(1)(d) Quality Control and Assurance

The authorized laboratory must test screenings for retention under the Vialit test method for aggregate in chip seals (french chip). The Vialit test results are not used for acceptance. The Vialit test is available at the METS Web site.

If the test results for polymer asphaltic emulsion do not comply with the specifications, the Engineer assesses a pay factor value for the following properties and increments:

Polymer Asphaltic Emulsion Pay Factor Table

Test method and property	Increment	Pay factor
Test on polymer asphaltic emulsion		
AASHTO T 59 (Viscosity, sec Saybolt Furol, at 50 °C)	Each 10 seconds above max or below min	1
AASHTO T 59 (settlement, 5 days, percent)	Each 1.5 percent above max	1
AASHTO T 59 (sieve test, percent max)	Each 0.2 percent above max	1
AASHTO T 59 (demulsibility percent)	Each 2 percent below min	1
Test on residue from evaporation test		
AASHTO T 49 (penetration, 25 °C)	Each 2 dm above max or below min	1
ASTM D 36 (field softening point °C)	2 °C below min	1
California Test 332 (torsional recovery ^a)	For each 1 increment below the min value of 18	1
	For each 2 increments below the min value of 18	3
	For each 3 or more increments below the min value of 18	10
ASTM T 301 (elastic recovery ^a)	For each 1 increment below the min value of 60	1
	For each 2 increment below the min value of 60	3
	For each 3 increment below the min value of 60	10

^a The highest pay factor applies

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The Engineer assesses a pay factor of 1 for sampling not performed in compliance with the specifications, including shipping and sampling containers.

For polymer asphaltic emulsion seal coat, if a test result for the screenings cleanness value is from 75 to 86, you may request that the asphaltic emulsion seal coat represented by the test remain in place. A payment deduction is made as specified in section 37-2.04D. If the screenings cleanness value is less than 75, remove the asphaltic emulsion seal coat.

37-2.04C(2) Materials

Polymer asphaltic emulsion must include elastomeric polymer.

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Polymer asphaltic emulsion must comply with section 94, Table 3, under the test on residue from evaporation test for Grades PMRS2, PMRS2h, PMCRS2, and PMCRS2h and the following:

1. The penetration at 39.2 degrees F (200g for 60 seconds) determined under AASHTO T 49 must be at least 6.
2. Elastic recovery determined under AASHTO T 301 must be at least 60 percent.
3. Polymer content in percent by weight does not apply.
4. The ring and ball softening point temperature determined under AASHTO T 53 for Test on Residue from Evaporation Test must comply with the following minimum temperature requirement:
 - 4.1. 126 degrees F for a geographical ambient temperature from 32 to 104 degrees F
 - 4.2. 129 degrees F for a geographical ambient temperature from 18 to 104 degrees F
 - 4.3. 135 degrees F for a geographical ambient temperature from 18 to greater than 104 degrees F

Screenings for polymer asphaltic emulsion seal coat must have the gradation as determined under California Test 202 in the following table:

Polymer Asphaltic Emulsion Seal Coat Screenings Gradation

Sieve sizes	Percentage passing			
	Coarse 1/2" max	Medium 3/8" max	Medium fine 5/16" max	Fine 1/4" max
3/4"	100	--	--	--
1/2"	85-100	100	--	--
3/8"	0-30	85-100	100	100
No. 4	0-5	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	0-2

The cleanness value determined under California Test 227 must be 86 or greater.

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37-2.04C(3) Construction

07-19-13

Polymer asphaltic emulsion must be applied within the application rate ranges shown in the following table:

Polymer Asphaltic Emulsion Application Rates

Screenings	Application rate range(gallons per square yard)
Fine	0.15-0.30
Medium fine	0.25-0.35
Medium	0.25-0.40
Coarse	0.30-0.40

Apply polymer asphaltic emulsion when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply polymer asphaltic emulsion when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

For double asphaltic emulsion seal coat, polymer asphaltic emulsion must be applied within the application rates shown in the following table:

Polymer Asphaltic Emulsion Application Rates

Screenings	Application rate range (gal/sq yd)
Double	
1st application	0.20-0.35
2nd application	0.20-0.30

You may stockpile screenings for polymer emulsion seal coat if you prevent contamination. Screenings must have damp surfaces at spreading. If water visibly separates from the screenings, do not spread. You may redampen them in the delivery vehicle.

Spread screenings before the polymer emulsion sets or breaks.

Spread screenings within 10 percent of the rate determined by the Engineer. Screenings must have a spread rate within the ranges shown in the following table:

Screening Spread Rates

Seal coat type	Range (lb/sq yd)
Fine	12-20
Medium fine	16-25
Medium	20-30
Coarse	23-30

Do not spread screenings more than 2,500 feet ahead of the completed initial rolling.

For double seal coat, screenings must have a spread rate within the ranges shown in the following table:

Screening Spread Rates

Seal coat type	Range (lb/sq yd)
Double	
1st application	23-30
2nd application	12-20

Remove excess screenings on the 1st application before the 2nd application of asphaltic emulsion.

37-2.04C(4) Payment

If polymer asphaltic emulsion seal coat with screenings does not comply with the specifications for cleanness value you may request that the seal coat remain in place with a pay deduction corresponding by the cleanness value shown in the following table:

Polymer Asphaltic Emulsion Seal Coat Cleanness Value Deductions

Cleanness value	Deduction
86 or over	None
81-85	\$2.20/ton
77-80	\$4.40/ton
75-76	\$6.60/ton

If test results for polymer asphaltic emulsion aggregate grading and cleanness value test results do not comply with the specifications, all deductions are made. A test for polymer asphaltic emulsion represents the smaller of 55 tons or 1 day's production. A test for the screenings grading or cleanness value represents the smaller of 300 tons or 1 day's production.

The payment deduction for noncompliant polymer asphaltic emulsion is based on the total pay factor value determined from the table titled, "Polymer Asphaltic Emulsion Pay Factor Deduction." You must remove polymer asphaltic emulsion seal coat with a pay factor value greater than 20. You may request seal coat with noncompliant polymer asphaltic emulsion to remain in place with a pay deduction for the total pay factor value shown in the following table:

Polymer Asphaltic Emulsion Pay Factor Deductions

Total pay factor value	Deduction
0	none
1-2	\$5.00/ton
3-5	\$10.00/ton
6-9	\$15.00/ton
10-14	\$25.00/ton
15-20	\$50.00/ton

37-2.05 ASPHALT BINDER SEAL COATS

37-2.05A General

Reserved

37-2.05B Asphalt Rubber Binder Seal Coats

37-2.05B(1) General

37-2.05B(1)(a) Summary

Section 37-2.05B includes specifications for applying asphalt rubber binder seal coat. Asphalt rubber seal coat includes applying heated asphalt rubber binder, followed by heated screenings precoated with asphalt binder, followed by a flush coat.

37-2.05B(1)(b) Definitions

crumb rubber modifier: Ground or granulated high natural crumb rubber or scrap tire crumb rubber.

descending viscosity reading: Subsequent viscosity reading at least 5 percent lower than the previous viscosity reading.

high natural crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of:

1. Automobile tires
2. Truck tires
3. Tire buffing

37-2.05B(1)(c) Submittals

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

Submit MSDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

1. Four 1-quart cans of mixed asphalt rubber binder
2. Samples of each asphalt rubber binder ingredient
3. Asphalt rubber binder formulation and data as follows:
 - 3.1. For asphalt binder and asphalt modifier submit:
 - 3.1.1. Source and grade of asphalt binder
 - 3.1.2. Source and type of asphalt modifier
 - 3.1.3. Percentage of asphalt modifier by weight of asphalt binder
 - 3.1.4. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
 - 3.1.5. Test results for the specified quality characteristics
 - 3.2. For crumb rubber modifier submit:
 - 3.2.1. Each source and type of scrap tire crumb rubber and high natural rubber
 - 3.2.2. Percentage of scrap tire crumb rubber and high natural rubber by total weight of asphalt rubber binder
 - 3.2.3. Test results for the specified quality characteristics
 - 3.3. For asphalt rubber binder submit:
 - 3.3.1. Test results for the specified quality characteristics
 - 3.3.2. Minimum reaction time and temperature

At least 5 business days before use, submit the permit issued by the local air quality agency for asphalt rubber binder:

1. Field blending equipment
2. Application equipment

If an air quality permit is not required by the local air quality agency for producing asphalt rubber binder or spray applying asphalt rubber binder, submit verification from the local air quality agency that an air quality permit is not required for this Contract.

Submit a certified volume or weight slip for each delivery of asphalt rubber binder ingredients and asphalt rubber binder.

Submit a certificate of compliance and accuracy verification of test results for viscometers.

When determined by the Engineer, submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

Submit the log of asphalt rubber binder viscosity test results each day of asphalt rubber seal coat work.

37-2.05B(1)(d) Quality Control and Assurance

Equipment used in producing asphalt rubber binder must be permitted for use by the local air quality agency. Equipment used in spreading asphalt rubber binder must be permitted for use by the local air quality agency.

Each asphalt rubber binder ingredient must be sampled and tested for compliance with the specifications by the manufacturer.

Test and submit results at least once per project or the following, whichever frequency is greater:

1. For crumb rubber modifier except for grading, at least once per 250 tons. Samples of scrap tire crumb rubber and high natural crumb rubber must be sampled and tested separately. Test each delivery of crumb rubber modifier for grading.
2. For asphalt binder, test and submit at least once per 200 tons of asphalt binder production.
3. For asphalt modifier, test and submit at least once per 25 tons of asphalt modifier production.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the asphalt rubber production site in separate bags.

Take viscosity readings of asphalt rubber binder under ASTM D7741 during asphalt rubber binder production. Start taking viscosity readings of samples taken from the reaction vessel 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 meets the specification requirement. After meeting the 2 descending viscosity readings requirement, continue to take viscosity readings hourly and within 15 minutes before use. Log the test results, including time of testing and temperature of the asphalt rubber binder.

37-2.05B(2) Material

37-2.05B(2)(a) General

Reserved

37-2.05B(2)(b) Asphalt Binder

Asphalt binder must comply with the specifications for asphalt binder. Do not modify asphalt binder with polymer.

37-2.05B(2)(c) Asphalt Modifier

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. Asphalt modifier must have the values for the quality characteristics shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Value
Viscosity, m ² /s (x 10 ⁻⁶) at 100 °C	ASTM D 445	X ± 3 ^a
Flash point, CL.O.C., °C	ASTM D 92	207 min
Molecular analysis		
Asphaltenes, percent by mass	ASTM D 2007	0.1 max
Aromatics, percent by mass	ASTM D 2007	55 min

^a "X" denotes the proposed asphalt modifier viscosity from 19 to 36. A change in "X" requires a new asphalt rubber binder submittal.

37-2.05B(2)(d) Crumb Rubber Modifier

Crumb rubber modifier must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural 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 crumb rubber modifier particles must be large enough to be ground or granulated.

Wire must not be more than 0.01 percent by weight of crumb rubber modifier. Crumb rubber modifier must be free of contaminants except fabric, which must not exceed 0.05 percent by weight of crumb rubber modifier. Method for determining the percent weight of wire and fabric is available under Laboratory Procedure 10 at the following METS Web site:

<http://www.dot.ca.gov/hq/esc/Translab/ofpm/fpmlab.htm>

The length of an individual crumb rubber modifier particle must not exceed 3/16 inch.

Crumb rubber modifier must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of crumb rubber modifier may be added. Crumb rubber modifier must not cause foaming when combined with the asphalt binder and asphalt modifier.

Specific gravity of crumb rubber modifier must be from 1.1 to 1.2 determined under California Test 208.

When tested under ASTM D 297, crumb rubber modifier must comply with the requirements shown in the following table:

Crumb Rubber Modifier

Quality characteristic	Scrap tire crumb rubber (percent)		High natural rubber (percent)	
	Min	Max	Min	Max
Acetone extract	6.0	16.0	4.0	16.0
Rubber hydrocarbon	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	--	8.0	--	--

Scrap tire crumb rubber must have the gradation shown in the following table:

Scrap Tire Crumb Rubber Gradation
Percentage passing

Sieve size	Gradation limit	Operating range	Contract compliance
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 crumb rubber must have the gradation shown in the following table:

High Natural Crumb Rubber Gradation
Percentage passing

Sieve size	Gradation limit	Operating range	Contract compliance
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

Test the crumb rubber modifier gradation under ASTM C 136 except

1. Split or quarter 100 ± 5 g from the crumb rubber modifier sample and dry to a constant mass at a temperature from 57 to 63 degrees C and record the dry sample mass. Place the crumb rubber modifier sample and 5 g of talc in a 1/2-liter jar. Seal the jar, then shake the jar by hand for at least 1 minute to mix the crumb rubber modifier and the talc. Continue shaking or open the jar and stir until the particle agglomerates and clumps are broken and the talc is uniformly mixed.
2. Place 1 rubber ball on each sieve. Each ball must weigh 8.5 ± 0.5 g, measure 24.5 ± 0.5 mm in diameter, and have a Shore Durometer "A" hardness of 50 ± 5 determined under ASTM D 2240. After sieving the combined material for 10 ± 1 minutes, disassemble the sieves. Brush material adhering to the bottom of a sieve into the next finer sieve. Weigh and record the mass of the material retained on the 2.36-millimeter sieve and leave this material (do not discard) on the scale or balance. Fabric balls must remain on the scale or balance and be placed together on the side to prevent them from being covered or disturbed when the material from finer sieves is placed onto the scale or balance. The material retained on the 2.00-millimeter sieve must be added to the scale or balance. Weigh and record that mass as the accumulative mass retained on the 2.00-millimeter sieve. Continue weighing and recording the accumulated masses retained on the remaining sieves until the accumulated mass retained in the pan has been determined. Before discarding the crumb rubber modifier sample, separately weigh and record the total mass of fabric balls in the sample.
3. Determine the mass of material passing the 75-micrometer sieve by subtracting the accumulated mass retained on the 75-micrometer sieve from the accumulated mass retained in the pan. If the material passing the 75-micrometer sieve has a mass of 5 g or less, cross out the recorded number for the accumulated mass retained in the pan and copy the number recorded for the accumulated mass retained on the 75-micrometer sieve and record that number, next to the crossed out number, as the accumulated mass retained in the pan. If the material passing the 75-micrometer sieve has a mass greater than 5 g, cross out the recorded number for the accumulated mass retained in the pan, subtract 5 g from that number and record the difference next to the crossed out number. The adjustment to the accumulated mass retained in the pan accounts for the 5 g of talc added to the sample. For calculation purposes, the adjusted total sample mass is the same as the adjusted

accumulated mass retained in the pan. Determine the percent passing based on the adjusted total sample mass and record to the nearest 0.1 percent.

37-2.05B(2)(e) Asphalt Rubber Binder

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 material plant quality program.

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

Asphalt rubber binder must be 79 ± 1 percent by weight asphalt binder and 21 ± 1 percent by weight of crumb rubber modifier. The minimum percentage of crumb rubber modifier must be 20.0 percent and lower values may not be rounded up.

Crumb rubber modifier must be 76 ± 2 percent by weight scrap tire crumb rubber and 24 ± 2 percent by weight high natural rubber.

Asphalt modifier and asphalt binder must be blended at the production site. 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, the asphalt binder must be from 375 to 440 degrees F when asphalt modifier is added and the mixture must circulate for at least 20 minutes. Asphalt binder, asphalt modifier, and crumb rubber modifier may be proportioned and combined simultaneously.

The blend of asphalt binder and asphalt modifier must be combined with crumb rubber modifier at the asphalt rubber binder production site. The asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when crumb rubber modifier 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 have the values for the quality characteristics shown in the following table:

Asphalt Rubber Binder			
Quality characteristic	Test method	Requirement	
		Min	Max
Cone penetration @ 25 °C, 1/10 mm	ASTM D 217	25	60
Resilience @ 25 °C, percent rebound	ASTM D 5329	18	50
Field softening point, °C	ASTM D 36	55	88
Viscosity @190 °C, Pa • s ($\times 10^{-3}$)	ASTM D 7741	1500	2500

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, asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add scrap tire crumb rubber. Scrap tire crumb rubber must not exceed 10 percent by weight of the asphalt rubber binder. Allow added scrap tire crumb rubber to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

37-2.05B(2)(f) Screenings

Before precoating with asphalt binder and when tested under California Test 202, screenings for asphalt rubber seal coat must have the gradation shown in the following table:

Asphalt Rubber Seal Coat Screenings Gradation

Sieve sizes	Percentage passing by weight		
	Coarse 1/2" max	Medium 1/2" max	Fine 3/8" max
3/4"	100	100	100
1/2"	75-90	85-90	95-100
3/8"	0-20	0-30	70-85
No. 4	0-2	0-5	0-15
No. 8	--	--	0-5
No. 200	0-1	0-1	0-1

Screenings must have the values for the properties shown in the following table:

Seal Coat Screenings

Properties	Test method	Value
Cleanness value, min	California Test 227	80
Durability, min	California Test 229	52

37-2.05B(3) Construction**37-2.05B(3)(a) General**

Reserved

37-2.05B(3)(b) Equipment

Self-propelled distributor truck for applying asphalt rubber binder must have the following features:

1. Heating unit
2. Internal mixing unit
3. Pumps that spray asphalt rubber binder within 0.05 gal/sq yd of the specified rate
4. Fully circulating spray bar that applies asphalt rubber binder uniformly
5. Tachometer
6. Pressure gages
7. Volume measuring devices
8. Thermometer
9. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed

37-2.05B(3)(c) Precoating Screenings

For asphalt rubber seal coat, do not recombine fine materials collected in dust control systems except cyclone collectors or knock-out boxes with any other aggregate used in the production of screenings.

For asphalt rubber seal coat, screenings 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. Coat at a central mixing plant. The asphalt must be from 0.5 to 1.0 percent by weight of dry screenings. The Engineer determines the exact rate.

Plant must be authorized under the Department's material plant quality program.

Do not stockpile preheated or precoated screenings.

37-2.05B(3)(d) Asphalt Rubber Binder Application

Apply asphalt rubber binder immediately after the reaction period. At the time of application, the temperature of asphalt rubber binder must be from 385 to 415 degrees F.

Apply asphalt rubber binder at a rate from 0.55 to 0.65 gal/sq yd. The Engineer determines the exact rate.

Apply asphalt rubber binder when the atmospheric temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply asphalt rubber binder unless there are sufficient screenings available 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 weather or road conditions are unsuitable, including high wind or when the pavement is damp. In windy conditions you may adjust the distributor bar height and distribution speed, and use shielding equipment, if the Engineer authorizes your request.

37-2.05B(3)(e) Screenings Application

During transit, cover precoated screenings for asphalt rubber seal coat with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

At the time of application, screenings for asphalt rubber seal coat must be from 225 to 325 degrees F.

Spread screenings at a rate from 28 to 40 lb/sq yd. The exact rate is determined by the Engineer. Spread to within 10 percent of the determined rate.

37-2.05B(3)(f) Rolling and Sweeping

Perform initial rolling within 90 seconds of spreading screenings. Do not spread screenings more than 200 feet ahead of the initial rolling.

For final rolling, you may request use of a steel-wheeled roller weighing from 8 to 10 tons, static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge screenings.

Dispose of swept screenings at least 150 feet from any waterway.

37-2.05B(4) Payment

Screenings for asphalt rubber seal coat are measured by coated weight after they are preheated and precoated with asphalt binder. The weight of screenings must be the coated weight.

If recorded batch weights are printed automatically, the bid item for screenings for asphalt-rubber seal coat are measured using the printed batch weights, provided:

1. Total aggregate weight for screenings per batch is printed
2. Total asphalt binder weight per batch is printed
3. Each truckload's zero tolerance weight is printed before weighing the first batch and after weighing the last batch
4. Time, date, mix number, load number and truck identification are correlated with a load slip
5. A copy of the recorded batch weights is certified by a licensed weighmaster and submitted to the Engineer

Screenings for asphalt rubber seal coat is paid for as precoated screenings.

Asphalt-rubber binder is measured under the specifications for asphalts.

If test results for gradation tests do not comply with the specifications, deductions are taken.

Each gradation test for scrap tire crumb rubber represents 10,000 lbs or the amount used in that day's production, whichever is less.

Each gradation test for high natural rubber represents 3,400 lbs or the amount used in that day's production, whichever is less.

For each gradation test, the following pay deductions will be taken from the asphalt rubber bid item:

Gradation Test

Material	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 crumb rubber	Operating range < TR < Contract compliance	\$250
High natural crumb rubber	TR > Contract compliance	\$600

^a Test Result = TR

37-2.05C Modified Asphalt Binder Seal Coat

Reserved

03-21-14

37-2.06 STRESS ABSORBING MEMBRANE INTERLAYER

37-2.06A General

Section 37-2.06 applies where a stress absorbing membrane interlayer (SAMI) is shown.

Comply with section 37-2.05B except a flush coat is not required.

37-2.06B Materials

For SAMI, screenings must comply with the 3/8-inch maximum gradation.

37-2.06C Construction

For SAMI, section 37-2.01C(7) does not apply.

Final rolling and sweeping are not required for SAMI.

37-2.06D Payment

Not Used

37-2.07–37-2.10 RESERVED

Add to section 37-3.01D(1):

Micro-surfacing spreader operators must attend the pre-paving conference.

01-18-13

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

39 HOT MIX ASPHALT

11-15-13

Add to section 39-1.01B:

02-22-13

processed RAP: RAP that has been fractionated.

substitution rate: Amount of RAP aggregate substituted for virgin aggregate in percent.

binder replacement: Amount of RAP binder in OBC in percent.

surface course: Upper 0.2 feet of HMA exclusive of OGFC.

Add to the end of the paragraph in section 39-1.02A:

as shown

10-19-12

Replace "less than 10 percent" in note "b" in the table in the 5th paragraph of section 39-1.02E with:

10 percent or less

01-20-12

Replace the paragraphs in section 39-1.02F with:

39-1.02F(1) General

02-22-13

You may produce HMA Type A or B 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 25 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

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.

AASHTO T 324 (Modified) is AASHTO T 324, "Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)," with the following parameters:

07-19-13

1. Target air voids must equal 7 ± 1 percent
2. Specimen height must be $60 \text{ mm} \pm 1 \text{ mm}$
3. Number of test specimens must be 4
4. Test specimen must be a 150mm gyratory compacted specimen
5. Test temperature must be set at:
 - 5.1. 122 ± 2 degrees F for PG 58
 - 5.2. 131 ± 2 degrees F for PG 64
 - 5.3. 140 ± 2 degrees F for PG 70 and above
6. Measurements for impression must be taken at every 100 passes
7. Inflection point defined as the number of wheel passes at the intersection of the creep slope and the stripping slope
8. Testing shut off must be set at 25,000 passes

02-22-13

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.

39-1.02F(3) Substitution Rate Greater than 15 Percent

07-19-13

For a RAP substitution rate greater than 15 percent, fractionate RAP into 2 sizes, a coarse fraction RAP retained on 3/8-inch screen and a fine fraction RAP passing 3/8-inch screen.

Sample and test processed RAP at a minimum frequency of 1 sample per 1000 tons with a minimum of 6 samples for each processed RAP stockpile. If a processed RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

When tested under California Test 202 with a total mechanical shaking time of 10 minutes \pm 15 seconds, the processed RAP must meet the grading requirements shown in the following table:

**Processed RAP Gradation
(Percentage Passing)**

Sieve sizes	TV limits	Allowable tolerance
1/2"	100	--
3/8"	97	TV + 3

02-22-13

The processed RAP asphalt binder content must be within \pm 2.0 percent of the average processed RAP stockpile asphalt binder content when tested under ASTM D 2172, Method B. If a new processed RAP stockpile is required, the average binder content of the new processed RAP stockpile must be within \pm 2.0 percent of the average binder content of the original processed RAP stockpile.

The maximum specific gravity for processed RAP must be within \pm 0.06 when tested under California Test 309 of the average maximum specific gravity reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form.

Replace items 7 and 8 in the 5th paragraph of section 39-1.03A with:

02-22-13

7. Substitution rate by more than 5 percent if your assigned RAP substitution rate is 15 percent or less
8. Substitution rate by more than 3 percent if your assigned RAP substitution rate is greater than 15 percent
9. Average binder content by more than 2 percent from the average binder content of the original processed RAP stockpile used in the mix design
10. Maximum specific gravity of processed RAP by more than \pm 0.060 from the average maximum specific gravity of processed RAP reported on page 4 of your *Contractor Hot Mix Asphalt Design Data* form
11. Any material in the JMF

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

02-22-13

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

HMA Mix Design Requirements

Quality characteristic	Test method	HMA type		
		A	B	RHMA-G
Air void content (%)	California Test 367	4.0	4.0	Section 39-1.03B
Voids in mineral aggregate (% min.)	California Test 367			
No. 4 grading		17.0	17.0	--
3/8" grading		15.0	15.0	--
1/2" grading		14.0	14.0	18.0-23.0
3/4" grading		13.0	13.0	18.0-23.0
Voids filled with asphalt (%)	California Test 367			Note a
No. 4 grading		65.0-75.0	65.0-75.0	
3/8" grading		65.0-75.0	65.0-75.0	
1/2" grading		65.0-75.0	65.0-75.0	
3/4" grading		65.0-75.0	65.0-75.0	
Dust proportion	California Test 367			Note a
No. 4 and 3/8" gradings		0.6-1.2	0.6-1.2	
1/2" and 3/4" gradings		0.6-1.2	0.6-1.2	
Stabilometer value (min.)	California Test 366			
No. 4 and 3/8" gradings		30	30	--
1/2" and 3/4" gradings		37	35	23

^a Report this value in the JMF submittal.

For RAP substitution rate greater than 15 percent, the mix design must comply with the additional quality characteristics shown in the following table:

**Additional HMA Mix Design Requirements
for RAP Substitution Rate Greater Than 15 Percent**

Quality characteristic	Test method	HMA type		
		A	B	RHMA-G
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth)	AASHTO T 324 (Modified) ^a			
PG-58		10,000	10,000	--
PG-64		15,000	15,000	
PG-70		20,000	20,000	
PG-76 or higher		25,000	25,000	
Hamburg wheel track (inflection point minimum number of passes)	AASHTO T 324 (Modified) ^a			
PG-58		10,000	10,000	--
PG-64		10,000	10,000	
PG-70		12,500	12,500	
PG-76 or higher		15000	15000	
Moisture susceptibility (minimum dry strength, psi)	California Test 371 ^a	120	120	--
Moisture susceptibility (tensile strength ration, %)	California Test 371 ^a	70	70	--

^aTest plant produced HMA.

For HMA with RAP, the maximum binder replacement must be 25.0 percent of OBC for surface course and 40.0 percent of OBC for lower courses.

For HMA with a binder replacement less than or equal to 25 percent of OBC, you may request that the PG asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For HMA with a binder replacement greater than 25 percent but less than or equal to 40 percent of OBC, you must use a PG asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

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

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

01-20-12

Add to the end of section 39-1.03C:

For RAP substitution rate greater than 15 percent, submit with the JMF submittal:

02-22-13

1. California Test 371 tensile strength ratio and minimum dry strength test results
2. AASHTO T 324 (Modified) test results

For RAP substitution rate greater than 15 percent, submit California Test 371 and AASHTO T 324 (Modified) test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

Replace the 2nd paragraph of section 39-1.03E with:

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.

04-20-12

Add between the 3rd and 4th paragraphs of section 39-1.03E:

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:

04-20-12

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

Where:

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

R_{RAP} = RAP ratio by weight of aggregate

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

Replace item 4 in the list in the 8th paragraph of section 39-1.03E with:

4. HMA quality specified in the table titled "HMA Mix Design Requirements" except:
 - 4.1. Air void content, design value ± 2.0 percent
 - 4.2. Voids filled with asphalt, report only

04-20-12

4.3. Dust proportion, report only

Replace the 12th paragraph of section 39-1.03E with:

04-20-12

If tests on plant-produced samples do not verify the JMF, the Engineer notifies you and you must submit a new JMF or submit an adjusted JMF based on your testing. JMF adjustments may include a change in aggregate gradation TV within the TV limits specified in the aggregate gradation tables.

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

01-20-12

A verified JMF is valid for 12 months.

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

01-20-12

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

Replace the 16th paragraph of section 39-1.03E with:

02-22-13

Except for RAP substitution rate greater than 15 percent, for any HMA produced under the QC/QA process the Department does not use California Test 371 test results for verification.

Add between the 1st and 2nd paragraphs of section 39-1.03F:

04-20-12

Target asphalt binder content on your *Contractor Job Mix Formula Proposal* form and the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form must be the same.

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

01-20-12

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

01-20-12

3. Engineer verifies each proposed JMF renewal within 20 days of receiving verification samples.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at the Department's expense 1 proposed JMF renewal within a 12-month period.

Add between the 6th and 7th paragraphs of section 39-1.03F:

01-20-12

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or the Engineer may perform aggregate quality tests for verification of JMF renewal.

Replace section 39-1.03G with:

04-20-12

39-1.03G Job Mix Formula Modification

For an accepted JMF, you may change asphalt binder source one time during production.

Submit your modified JMF request a minimum of 3 business days before production. Each modified JMF submittal must consist of:

1. Proposed modified JMF on *Contractor Job Mix Formula Proposal* form
2. Mix design records on *Contractor Hot Mix Asphalt Design Data* form for the accepted JMF to be modified
3. JMF verification on *Hot Mix Asphalt Verification* form for the accepted JMF to be modified
4. Quality characteristics test results for the modified JMF as specified in section 39-1.03B. Perform tests at the mix design OBC as shown on the *Contractor Asphalt Mix Design Data* form
5. If required, California Test 371 test results for the modified JMF.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 5 business days of receiving all verification samples. If California Test 371 is required, the Engineer tests for California Test 371 within 10 days of receiving verification samples.

The Engineer verifies the modified JMF after the modified JMF HMA is placed on the project and verification samples are taken within the first 750 tons following sampling requirements in section 39-1.03E, "Job Mix Formula Verification." The Engineer tests verification samples for compliance with:

1. Stability as shown in the table titled "HMA Mix Design Requirements"
2. Air void content at design value ± 2.0 percent
3. Voids in mineral aggregate as shown in the table titled "HMA Mix Design Requirements"
4. Voids filled with asphalt, report only
5. Dust proportion, report only

If the modified JMF is verified, the Engineer revises your *Hot Mix Asphalt Verification* form to include the new asphalt binder source. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected.

The Engineer deducts \$2,000 from payments for each modified JMF verification. The Engineer deducts an additional \$2,000 for each modified JMF verification that requires California Test 371.

Add to section 39-1.03:

01-20-12

39-1.03H Job Mix Formula Acceptance

You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications.
2. The Department has verified the JMF within 12 months before HMA production.
3. The Engineer accepts the verified JMF.

Replace "3 days" in the 1st paragraph of section 39-1.04A with:

3 business days

01-20-12

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

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

01-20-12

Replace "batch" in the 2nd sentence in the 2nd paragraph of section 39-1.04C with:

lot. Each asphalt binder lot consist of 1 or multiple batches of combined asphalt binder, asphalt modifier, and CRM proportioned under section 39-1.02D.

07-19-13

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

02-22-13

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

For RAP substitution rate of greater than 15percent, sample processed RAP twice daily.

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

Replace "5 days" in the 1st paragraph of section 39-1.06 with:

01-20-12

5 business days

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

04-20-12

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

Add to section 39-1.08A:

04-20-12

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

07-19-13

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

For RAP substitution greater than 15, you may adjust the RAP by -3 percent.

04-20-12

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

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

09-16-11

Asphalt rubber binder must be from 375 to 425 degrees F when mixed with aggregate.

Add to the beginning of section 39-1.08C:

07-19-13

Asphalt rubber binder blending plants must have current qualification under the Department's Material Plant Quality Program.

Replace section 39-1.11 with:

01-18-13

39-1.11 CONSTRUCTION

39-1.11A General

Do not place 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

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 ft is not allowed at any time between adjacent lanes open to traffic.

For HMA thickness of 0.15 ft or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For HMA thickness greater than 0.15 ft, you must 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

For divided highways with an HMA lift thickness greater than 0.15 foot, you may construct a 1-foot wide tapered notched wedge joint as a longitudinal joint between adjacent lanes open to traffic. A vertical notch of 0.75 inch maximum must be placed at the top and bottom of the tapered wedge.

The tapered notched wedge must retain its shape while exposed to traffic. Pave the adjacent lane within 1 day.

Construct the tapered portion of the tapered notched wedge with an authorized strike-off device. The strike-off device must provide a uniform slope and must not restrict the main screed of the paver.

You may use a device attached to the screed to construct longitudinal joints that will form a tapered notched wedge in a single pass. The tapered notched wedge must be compacted to a minimum of 91 percent compaction.

Perform QC testing on the completed tapered notch wedge joint as follows:

1. Perform field compaction tests at the rate of 1 test for each 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform field compaction tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.

3. Determine maximum density test results.
4. Determine percent compaction of the longitudinal joint as the ratio of the average of the field compaction values and the maximum density test results.

For HMA under QC/QA construction process, the additional quality control compaction results associated with the tapered notch wedge will not be included in the computation of any quality factor and process control.

For acceptance of the completed tapered notch wedge joint, take two 4- or 6-inch diameter cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations designated by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Cores must be taken in the presence of the Engineer and must be marked to identify the test sites. Submit the cores. One core will be used for determination of the field density and 1 core will be used for dispute resolution. The Engineer determines:

1. Field compaction by measuring the bulk specific gravity of the cores under California Test 308, Method A
2. Percent compaction as the ratio of the average of the bulk specific gravity of the core for each day's production to the maximum density test value

For HMA under QC/QA construction process, the additional quality assurance testing by the Engineer to determine field compaction associated with the tapered notch wedge will not be included in the Engineer's verification testing and in the computation of any quality factor and process control.

Determine percent compaction values each day the joint is completed and submit values within 24 hours of testing. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process in order to meet the specifications.

For HMA under QC/QA construction process, quantities of HMA placed in the completed longitudinal joint will have a quality factor QF_{QCS} of 1.0.

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.

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.

Do not use a pneumatic-tired roller to compact RHMA-G.

For Standard and QC/QA construction processes, if 3/4-inch aggregate grading is specified, you may use a 1/2-inch aggregate grading if the specified total paved thickness is at least 0.15 foot and less than 0.20 foot thick.

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.

If you request and if authorized, you may cool HMA Type A and Type B with water when rolling activities are complete. Apply water under section 17-3.

Spread sand at a rate from 1 to 2 lb/sq yd on new RHMA-G, RHMA-O, and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(4)(c). Keep traffic off the pavement until spreading sand is complete.

Replace the 5th and 6th paragraphs of section 39-1.12C with:

07-20-12

On tangents and horizontal curves with a centerline radius of curvature 2,000 feet or more, the PI_0 must be at most 2.5 inches per 0.1-mile section.

On horizontal curves with a centerline radius of curvature between 1,000 feet and 2,000 feet including pavement within the superelevation transitions, the PI_0 must be at most 5 inches per 0.1-mile section.

Add to section 39-1.12:

01-20-12

39-1.12E Reserved

Add to section 39-1.14:

01-20-12

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

Replace "6.8" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

6.4

04-20-12

Replace "6.0" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

5.7

04-20-12

Replace "6.8" in the 1st paragraph of section 39-1.15B with:

6.4

04-20-12

Replace "6.0" in the 1st paragraph of section 39-1.15B with:

5.7

04-20-12

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

02-22-13

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

Minimum Quality Control—Standard Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA type			
			A	B	RHMA-G	OGFC
Aggregate gradation ^a	California Test 202	1 per 750 tons and any remaining part at the end of the project	JMF ± Tolerance ^b	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 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	1.0
Field compaction (% max. theoretical density) ^{d,e}	QC plan	2 per business day (min.)	91-97	91-97	91-97	--
Stabilometer value (min) ^c No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--	--
			37	35	23	--
Air void content (%) ^{c,f}	California Test 367		4 ± 2	4 ± 2	TV ± 2	--
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^g	California Test 226 or 370	2 per day during production	--	--	--	--
Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	As designated in the QC plan. At least once per project	90	25	--	90
			75	--	90	75
			70	20	70	90
Los Angeles Rattler (% max) Loss at 100 rev.	California Test 211		12	--	12	12

Loss at 500 rev.			45	50	40	40
Flat and elongated particles (% max by weight @ 5:1)	California Test 235		Report only	Report only	Report only	Report only
Fine aggregate angularity (% min) ^h	California Test 234		45	45	45	--
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		65.0-75.0 65.0-75.0 65.0-75.0 65.0-75.0	65.0-75.0 65.0-75.0 65.0-75.0 65.0-75.0	Report only	--
Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0-23.0 18.0-23.0	--
Dust proportion ^k 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	--
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is more	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--	--
Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is more	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--
Moisture susceptibility (minimum dry strength, psi) ^j	California Test 371	For RAP ≥15% 1 per 10,000 tons or 1 per project whichever is greater	120	120	--	--
Moisture susceptibility (tensile strength ration, %) ^j	California Test 371	For RAP ≥15% 1 per 10,000 tons or 1	70	70	--	--

		per project whichever is greater				
Smoothness	Section 39-1.12	--	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀
Asphalt rubber binder viscosity @ 375 °F, centipoises	Section 39-1.02D	Section 39-1.04C	--	--	1,500– 4,000	1,500– 4,000
Asphalt modifier	Section 39-1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Section 39-1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D

^a Determine combined aggregate gradation containing RAP under California Test 367.

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

^c Report the average of 3 tests from a single split sample.

^d Determine field compaction for any of the following conditions:

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

^e To determine field compaction use:

1. In-place density measurements using the method specified in your QC plan.
2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.

^f Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^g For adjusting the plant controller at the HMA plant.

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

ⁱ Report only.

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

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

02-22-13

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

HMA Acceptance—Standard Construction Process

Quality characteristic	Test method	HMA type						
		A	B	RHMA-G	OGFC			
Aggregate gradation ^a	California Test 202	JMF ± tolerance ^c	JMF ± tolerance ^c	JMF ± tolerance ^c	JMF ± tolerance ^c			
Sieve						3/4"	1/2"	3/8"
1/2"						X ^b		
3/8"							X	
No. 4								X
No. 8						X	X	X
No. 200	X	X	X					
Sand equivalent (min) ^d	California Test 217	47	42	47	--			
Asphalt binder content (%)	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40	JMF ± 0.40			
HMA moisture content (% max)	California Test 226 or 370	1.0	1.0	1.0	1.0			
Field compaction (% max. theoretical density) ^{e, f}	California Test 375	91–97	91–97	91–97	--			
Stabilometer value (min) ^d	California Test 366	30	30	--	--			
No. 4 and 3/8" gradings								
1/2" and 3/4" gradings		37	35	23	--			
Air void content (%) ^{d, g}	California Test 367	4 ± 2	4 ± 2	TV ± 2	--			
Percent of crushed particles	California Test 205	90	25	--	90			
Coarse aggregate (% min)								
One fractured face								
Two fractured faces								
Fine aggregate (% min)	70	20	70	90	90			
(Passing no. 4 sieve and retained on no. 8 sieve.)								
One fractured face								
Los Angeles Rattler (% max)	California Test 211	12	--	12	12			
Loss at 100 rev.								
Loss at 500 rev.		45	50	40	40			
Fine aggregate angularity (% min) ^h	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 (%) ⁱ	California Test 367	65.0–75.0	65.0–75.0	Report only	--			
No. 4 grading								
3/8" grading								
1/2" grading								
3/4" grading		65.0–75.0	65.0–75.0					
Voids in mineral aggregate (% min) ⁱ	California Test 367	17.0	17.0	--	--			
No. 4 grading								
3/8" grading								
1/2" grading								
3/4" grading		15.0	15.0					
		14.0	14.0	18.0–23.0				
		13.0	13.0	18.0–23.0				
Dust proportion ⁱ	California			Report only	--			

No. 4 and 3/8" gradings 1/2" and 3/4" gradings	Test 367	0.6-1.2 0.6-1.2	0.6-1.2 0.6-1.2		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--	--
Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--
Moisture susceptibility (minimum dry strength, psi) ^j	California Test 371	120	120	--	--
Moisture susceptibility (tensile strength ration, %) ^j	California Test 371	70	70	--	--
Smoothness	Section 39-1.12	12-foot straight- edge, must grind, and P ₁₀	12-foot straight- edge, must grind, and P ₁₀	12-foot straight- edge, must grind, and P ₁₀	12-foot straight- edge and must grind
Asphalt binder	Various	Section 92	Section 92	Section 92	Section 92
Asphalt rubber binder	Various	--	--	Section 92- 1.01D(2) and section 39-1.02D	Section 92-1.01D(2) and section 39-1.02D
Asphalt modifier	Various	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Various	--	--	Section 39-1.02D	Section 39-1.02D

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

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

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

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

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

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

^f To determine field compaction, the Engineer uses:

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

^g 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.

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

ⁱ Report only.

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

Replace the 5th paragraph of section 39-2.03A with:

01-20-12

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

1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.2 foot and any layer is less than 0.20 foot.

Replace the 1st paragraph of section 39-3.02A with:

02-22-13

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
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	Report only	--
		65.0–75.0	65.0–75.0		
		65.0–75.0	65.0–75.0		
		65.0–75.0	65.0–75.0		
Voids in mineral aggregate (% min) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	17.0	17.0	--	--
		15.0	15.0	--	--
		14.0	14.0	18.0–23.0	18.0–23.0
		13.0	13.0	18.0–23.0	18.0–23.0
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	Report only	--
		0.6–1.2	0.6–1.2		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^g PG-58 PG-64	AASHTO T 324 (Modified)	10,000	10,000	--	--
		15,000	15,000	--	--

PG-70 PG-76 or higher		20,000 25,000	20,000 25,000		
Hamburg wheel track (inflection point minimum number of passes) ^g	AASHTO T 324 (Modified)			--	--
PG-58		10,000	10,000		
PG-64		10,000	10,000		
PG-70		12,500	12,500		
PG-76 or higher		15000	15000		
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 nonmanufactured 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.

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

285 degrees F

01-20-12

Replace "5,000" in the 5th paragraph of section 39-4.02C with:

10,000

02-22-13

Replace the 7th paragraph of section 39-4.02C with:

Except for RAP substitution rate of greater than 15 percent, the Department does not use results from California Test 371 to determine specification compliance.

02-22-13

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

02-22-13

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

Minimum Quality Control—QC/QA Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA Type			Location of sampling	Maximum report -ing time allowance
			A	B	RHMA-G		
Aggregate gradation ^a	California Test 202	1 per 750 tons	JMF ± tolerance ^b	JMF ± tolerance ^b	JMF ± tolerance ^b	California Test 125	24 hours
Asphalt binder content (%)	California Test 379 or 382		JMF±0.40	JMF±0.40	JMF ±0.40	Loose mix behind paver See California Test 125	
Field compaction (% max. theoretical density) ^{c,d}	QC plan		92–96	92–96	91–96	QC plan	
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^e	California Test 226 or 370	2 per day during production	--	--	--	Stock-piles or cold feed belts	--
Sand equivalent (min) ^f	California Test 217	1 per 750 tons	47	42	47	California Test 125	24 hours
HMA moisture content (% max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	Loose Mix Behind Paver See California Test 125	24 hours
Stabilometer value (min) ^f	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--		48 hours
No. 4 and 3/8" gradings 1/2" and 3/4" gradings			37	35	23		
Air void content (%) ^{f,g}	California Test 367		4 ± 2	4 ± 2	TV ± 2		

Percent of crushed particles coarse aggregate (% min.): One fractured face Two fractured faces	California Test 205	As designated in QC plan. At least once per project.	90	25	--	California Test 125	48 hours
			75	--	90		
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve): One fractured face			70	20	70		
Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev.	California Test 211		12	--	12	California Test 125	
			45	50	40		
Fine aggregate angularity (% min) ^h	California Test 234		45	45	45	California Test 125	
Flat and elongated particle (% max by weight @ 5:1)	California Test 235		Report only	Report only	Report only	California Test 125	
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367				Report only		
			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				
Voids in mineral aggregate (% min.) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367						
		17.0	17.0	--			
		15.0	15.0	--			
		14.0	14.0	18.0-23.0			
		13.0	13.0	18.0-23.0			

Dust proportion ⁱ	California Test 367						
No. 4 and 3/8" gradings 1/2" and 3/4" gradings			0.6-1.2 0.6-1.2	0.6-1.2 0.6-1.2	Report only		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is greater	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--	--	
Hamburg wheel track (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project whichever is greater	10,000 10,000 12,500 15000	10,000 10,000 12,500 15000	--	--	
Moisture susceptibility (minimum dry strength, psi) ^j	California Test 371	1 per 10,000 tons or 1 per project whichever is greater	120	120	--	--	
Moisture susceptibility (tensile strength ratio, %) ^j	California Test 371	1 per 10,000 tons or 1 per project whichever is greater	70	70	70	--	
Smoothness	Section 39-1.12	--	12-foot straight-edge, must-grind, and PI ₀	12-foot straight-edge, must-grind, and PI ₀	12-foot straight-edge, must-grind, and PI ₀	--	
Asphalt rubber binder viscosity @ 375 °F, centipoises	Section 39-1.02D	--	--	--	1,500-4,000	Section 39-1.02D	24 hours
CRM	Section 39-1.02D	--	--	--	Section 39-1.02D	Section 39-1.02D	48 hours

- ^a Determine combined aggregate gradation containing RAP under California Test 367.
- ^b The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^c Determines field compaction for any of the following conditions:
 1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot.
 2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ^d To determine field compaction use:
 1. In-place density measurements using the method specified in your QC plan.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^e For adjusting the plant controller at the HMA plant.
- ^f Report the average of 3 tests from a single split sample.
- ^g Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ⁱ Report only.
- ^j Applies to RAP substitution rate greater than 15 percent.

Replace the 1st sentence in the 1st paragraph of section 39-4.03B(2) with:

01-20-12

For aggregate gradation and asphalt binder content, the minimum ratio of verification testing frequency to quality control testing frequency is 1:5.

Replace the 2nd "and" in the 7th paragraph of section 39-4.03B(2) with:

01-20-12

or

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

02-22-13

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

HMA Acceptance—QC/QA Construction Process

Index (i)	Quality characteristic				Weight -ing factor (w)	Test method	HMA type		
							A	B	RHMA-G
	Aggregate gradation ^a					California Test 202	JMF ± Tolerance ^c		
	Sieve	3/4"	1/2"	3/8"					
1	1/2"	X ^b	--	--	0.05				
1	3/8"	--	X	--	0.05				
1	No. 4	--	--	X	0.05				
2	No. 8	X	X	X	0.10				
3	No. 200	X	X	X	0.15				
4	Asphalt binder content (%)				0.30	California Test 379 or 382	JMF±0.40	JMF±0.40	JMF ± 0.40
5	Field compaction (% max. theoretical density) ^{d, e}				0.40	California Test 375	92–96	92–96	91–96
	Sand equivalent (min) ^f					California Test 217	47	42	47
	Stabilometer value (min) ^f No. 4 and 3/8" gradings 1/2" and 3/4" gradings					California Test 366	30 37	30 35	-- 23
	Air void content (%) ^{f, g}					California Test 367	4 ± 2	4 ± 2	TV ± 2
	Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on No. 8 sieve.) One fractured face					California Test 205	90 75	25 --	-- 90
	HMA moisture content (% max)					California Test 226 or 370	1.0	1.0	1.0
	Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.					California Test 211	12 45	-- 50	12 40
	Fine aggregate angularity (% min) ^h					California Test 234	45	45	45
	Flat and elongated particle (% max by weight @ 5:1)					California Test 235	Report only	Report only	Report only
	Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading					California Test 367	17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0–23.0 18.0–23.0

	Voids filled with asphalt (%) No. 4 grading 3/8" grading 1/2" grading 3/4" grading		California Test 367	65.0-75.0 65.0-75.0 65.0-75.0 65.0-75.0	65.0-75.0 65.0-75.0 65.0-75.0 65.0-75.0	Report only
	Dust proportion ⁱ 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
	Hamburg Wheel Tracker (minimum number of passes at 0.5 inch average rut depth) ^j PG-58 PG-64 PG-70 PG-76 or higher		AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--
	Hamburg Wheel Tracker (inflection point minimum number of passes) ^j PG-58 PG-64 PG-70 PG-76 or higher		AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000	10,000 15,000 20,000 25,000	--
	Moisture susceptibility (minimum dry strength, psi) ^j		California Test 371	120	120	--
	Moisture susceptibility (tensile strength ratio %) ^j		California Test 371	70	70	70
	Smoothness		Section 39-1.12	12-foot straight-edge, must grind, and PI ₀	12-foot straight-edge, must grind, and PI ₀	12-foot straight-edge, must grind, and PI ₀
	Asphalt binder		Various	Section 92	Section 92	Section 92
	Asphalt rubber binder		Various	--	--	Section 92-1.01D(2) and section 39-1.02D
	Asphalt modifier		Various	--	--	Section 39-1.02D
	CRM		Various	--	--	Section 39-1.02D

- ^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.
- ^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.
- ^c The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^d The Engineer determines field compaction for any of the following conditions:
 1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and less than 0.20 foot.
 2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 foot.
- ^e To determine field compaction, the Engineer uses:
 1. California Test 308, Method A, to determine in-place density of each density core.
 2. California Test 309 to determine the maximum theoretical density at the frequency specified in California Test 375, Part 5C.
- ^f The Engineer reports the average of 3 tests from a single split sample.
- ^g 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.
- ^h The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.
- ⁱ Report only.
- ^j Applies to RAP substitution rate greater than 15 percent.

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

01-20-12

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

- 11-15-13">1. 1/2-inch, 3/8-inch, or no. 4 aggregate grading is used and the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot.
- 01-20-12">2. 3/4-inch aggregate grading is used and the specified total paved thickness is at least 0.20 and any layer is less than 0.20 foot.

40 CONCRETE PAVEMENT

07-19-13

Replace the headings and paragraphs in section 40 with:

40-1 GENERAL

07-19-13

40-1.01 GENERAL

40-1.01A Summary

Section 40-1 includes general specifications for constructing concrete pavement.

40-1.01B Definitions

concrete raveling: Progressive disintegration of the pavement surface resulting from dislodged aggregate.

full depth crack: Crack that runs from one edge of the slab to the opposite or adjacent side of the slab, except a crack parallel to and within 0.5 foot of either side of a planned contraction joint

working crack: Crack that extends through the full depth of the slab and is parallel to and within 0.5 foot of either side of a planned contraction joint.

action limit: Value at which corrective actions must be made while production may continue.

suspension limit: Value at which production must be suspended while corrections are made.

40-1.01C Submittals

40-1.01C(1) General

At least 15 days before delivery to the job site, submit manufacturer's recommendations and instructions for storage and installation of:

1. Threaded tie bar splice couplers
2. Joint filler

As an informational submittal, submit calibration documentation and operational guidelines for frequency measuring devices (tachometer) for concrete consolidation vibrators.

Submit updated quality control charts each paving day.

40-1.01C(2) Certificates of Compliance

Submit a certificate of compliance for:

1. Tie bars
2. Threaded tie bar splice couplers
3. Dowel bars
4. Tie bar baskets
5. Dowel bar baskets
6. Joint filler
7. Epoxy powder coating

40-1.01C(3) Quality Control Plan

Submit a concrete pavement QC plan. Allow 30 days for review.

40-1.01C(4) Mix Design

At least 15 days before testing for mix proportions, submit a copy of the AASHTO accreditation for your laboratory determining the mix proportions. At least 15 days before starting field qualification, submit the proposed concrete mix proportions, the corresponding mix identifications, and laboratory test reports including the modulus of rupture for each trial mixture at 10, 21, 28, and 42 days.

40-1.01C(5) Concrete Field Qualification

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cubic yards. The minimum batch size is 5 cu yd.
4. Type and source of ingredients used
5. Penetration of the concrete
6. Air content of the plastic concrete
7. Age and strength at time of concrete beam testing

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

40-1.01C(6) Cores

Submit for authorization the name of the laboratory you propose to use for testing the cores for air content.

Submit each core in an individual plastic bag marked with a location description.

40-1.01C(7) Profile Data and Straightedge Measurements

At least 5 business days before start of initial profiling or changing profiler or operator, submit:

1. Inertial profiler (IP) certification issued by the Department. The certification must not be more than 12 months old.

2. Operator certification for the IP issued by the Department. The operator must be certified for each different model of IP device operated. The certification must not be more than 12 months old.
3. List of manufacturer's recommended test procedures for IP calibration and verification.

Within 2 business days after cross correlation testing, submit ProVAL profiler certification analysis report for cross correlation test results performed on test section. ProVAL is FHWA's software. Submit the certification analysis report to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days after each day of inertial profiling, submit profile data to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days of performing straightedge testing, submit a report of areas requiring smoothness correction.

40-1.01C(8)–40-1.01C(12) Reserved

40-1.01D Quality Control and Assurance

40-1.01D(1) General

If the pavement quantity is at least 2000 cu yd, provide a QC manager.

Core pavement as described for, thickness, bar placement, and air content.

For the Department's modulus of rupture testing, assist the Engineer in fabricating test beams by providing materials and labor.

Allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is scheduled to be opened to traffic. Notify the Engineer when the pavement is ready for testing which is the latter of:

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

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

40-1.01D(2) Prepaving Conference

Schedule a prepaving conference at a mutually agreed upon time and place to meet with the Engineer. Make the arrangements for the conference facility. Discuss QC plan and methods of performing each item of the work.

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

1. Project superintendent
2. QC manager
3. Paving construction foreman
4. Workers and your subcontractor's workers, including:
 - 4.1. Foremen including subcontractor's Foremen
 - 4.2. Concrete plant manager
 - 4.3. Concrete plant operator

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

40-1.01D(3) Just-In-Time-Training

Reserved

40-1.01D(4) Quality Control Plan

Establish, implement, and maintain a QC plan for pavement. 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 out of those limits. Suspension limits must not exceed specified acceptance criteria.

The QC plan must address the elements affecting concrete pavement quality including:

1. Mix proportions
2. Aggregate gradation
3. Materials quality
4. Stockpile management
5. Line and grade control
6. Proportioning
7. Mixing and transportation
8. Placing and consolidation
9. Contraction and construction joints
10. Bar reinforcement placement and alignment
11. Dowel bar placement, alignment, and anchorage
12. Tie bar placement
13. Modulus of rupture
14. Finishing and curing
15. Protecting pavement
16. Surface smoothness

40-1.01D(5) Mix Design

Use a laboratory that complies with ASTM C 1077 to determine the mix proportions for concrete pavement. The laboratory must have a current AASHTO accreditation for:

1. AASHTO T 97 or ASTM C 78
2. ASTM C 192/C 192M

Make trial mixtures no more than 24 months before field qualification.

Using your trial mixtures, determine the minimum cementitious materials content. Use your value for minimum cementitious material content for *MC* in equation 1 and equation 2 of section 90-1.02B(3).

To determine the minimum cementitious materials content or maximum water to cementitious materials ratio, use modulus of rupture values of at least 570 psi for 28 days age and at least 650 psi for 42 days age.

If changing an aggregate supply source or the mix proportions, produce a trial batch and field-qualify the new concrete. The Engineer does not adjust contract time for performing sampling, testing, and qualifying new mix proportions or changing an aggregate supply source.

40-1.01D(6) Quality Control Testing

40-1.01D(6)(a) General

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

40-1.01D(6)(b) Concrete Mix

Before placing pavement, your mix design must be field qualified. Use an ACI certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations. Test for modulus of rupture under California Test 523 at 10, 21, and 28 days of age.

When placing pavement, your quality control must include testing properties at the frequencies shown in the following table:

QC Testing Frequency

Property	Test method	Minimum frequency
Cleanness value	California Test 227	2 per day
Sand equivalent	California Test 217	2 per day
Aggregate gradation	California Test 202	2 per day
Air content (air entrainment specified)	California Test 504	1 per hour
Air content (air entrainment not specified)	California Test 504	1 per 4 hours
Density	California Test 518	1 per 4 hours
Penetration	California Test 533	1 per 4 hours
Aggregate moisture meter calibration ^a	California Test 223 or California Test 226	1 per day

^a Check calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Maintain control charts to identify potential problems and assignable causes. Post a copy of each control chart at a location determined by the Engineer.

Individual measurement control charts must use the target values in the mix proportions as indicators of central tendency.

Develop linear control charts for:

1. Cleanness value
2. Sand equivalent
3. Fine and coarse aggregate gradation
4. Air content
5. Penetration

Control charts must include:

1. Contract number
2. Mix proportions
3. Test number
4. Each test parameter
5. Action and suspension limits
6. Specification limits
7. Quality control test results

For fine and coarse aggregate gradation control charts, record the running average of the previous 4 consecutive gradation tests for each sieve and superimpose the specification limits.

For air content control charts, the action limit is ± 1.0 percent of the specified value. If no value is specified, the action limit is ± 1.0 percent of the value used for your approved mix design.

As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
 - 2.1. One point falls outside the suspension limit line
 - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent material.

Before each day's concrete pavement placement and at intervals not to exceed 4 hours of production, use a tachometer to test and record vibration frequency for concrete consolidation vibrators.

40-1.01D(6)(c) Pavement Smoothness

40-1.01D(6)(c)(i) General

Notify the Engineer 2 business days before performing smoothness testing including IP calibration and verification testing. The notification must include start time and locations by station.

Before testing the pavement smoothness, remove foreign objects from the surface, and mark the beginning and ending station on the pavement shoulder.

Test pavement smoothness using an IP except use a 12-foot straightedge at the following locations:

1. Traffic lanes less than 1,000 feet in length including ramps, turn lanes, and acceleration and deceleration lanes
2. Areas within 15 feet of manholes
3. Shoulders
4. Weigh-in-motion areas
5. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

40-1.01D(6)(c)(ii) Straightedge Testing

Identify locations of areas requiring correction by:

1. Location Number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a lane:
 - 4.1. Lane direction as NB, SB, EB, or WB
 - 4.2. Lane number from left to right in direction of travel
 - 4.3. Wheel path as "L" for left, "R" for right, or "B" for both
5. For correction areas not within a lane:
 - 5.1. Identify pavement area (e.g., shoulder, weight station, turnout)
 - 5.2. Direction and distance from centerline as "L" for left or "R" for right
6. Estimated size of correction area

40-1.01D(6)(c)(iii) Inertial Profile Testing

IP equipment must display a current certification decal with expiration date.

Conduct cross correlation IP verification test in the Engineer's presence before performing initial profiling. Verify cross correlation IP verification test at least annually. Conduct 5 repeat runs of the IP on an authorized test section. The test section must be on an existing concrete pavement surface 0.1 mile long. Calculate a cross correlation to determine the repeatability of your device under Section 8.3.1.2 of AASHTO R 56 using ProVAL profiler certification analysis with a 3 feet maximum offset. The cross correlation must be a minimum of 0.92.

Conduct the following IP calibration and verification tests in the Engineer's presence each day before performing inertial profiling:

1. Block test. Verify the height sensor accuracy under AASHTO R 57, section 5.3.2.3.
2. Bounce test. Verify the combined height sensor and accelerometer accuracy under AASHTO R 57, section 5.3.2.3.2.
3. DMI test. Calibrate the accuracy of the testing procedure under AASHTO R 56, section 8.4.
4. Manufacturer's recommended tests.

Collect IP data using the specified ProVAL analysis with 250 mm and IRI filters. Comply with the requirements for data collection under AASHTO R 56.

For IP testing, wheel paths are 3 feet from and parallel to the edge of a lane. Left and right are relative to the direction of travel. The IRI is the pavement smoothness along a wheel path of a given lane. The MRI is the average of the IRI values for the left and right wheel path from the same lane.

Operate the IP according to the manufacturer's recommendations and AASHTO R 57 at 1-inch recording intervals and a minimum 4 inch line laser sensor.

Collect IP data under AASHTO R 56. IP data must include:

1. Raw profile data for each lane.
2. ProVAL ride quality analysis report for the international roughness index (IRI) of left and right wheel paths of each lane. Submit in pdf file format.
3. ProVAL ride quality analysis report for the mean roughness index (MRI) of each lane. Submit in pdf file format.
4. ProVAL smoothness assurance analysis report for IRIs of left wheel path. Submit in pdf file format.
5. ProVAL smoothness assurance analysis report for IRIs of right wheel path. Submit in pdf file format.
6. GPS data file for each lane in GPS exchange. Submit in GPS eXchange file format.
7. Manufacturer's recommended IP calibration and verification tests results.
8. AASHTO IP calibration and verification test results including bounce, block, and distance measurement instrument (DMI).

Submit the IP raw profile data in unfiltered electronic pavement profile file (PPF) format. Name the PPF file using the following naming convention:

YYYYMMDD_TTCCRRR_D_L_W_S_X_PT.PPF

where:

YYYY = year

MM = Month, leading zero

DD = Day of month, leading zero

TT = District, leading zero

CCC = County, 2 or 3 letter abbreviation as shown in section 1-1.08

RRR = Route number, no leading zeros

D = Traffic direction as NB, SB, WB, or EB

L = Lane number from left to right in direction of travel

W = Wheel path as "L" for left, "R" for right, or "B" for both

S = Beginning station to the nearest foot (e.g., 10+20) or beginning post mile to the nearest hundredth (e.g., 25.06) no leading zero

X = Profile operation as "EXIST" for existing pavement, "PAVE" for after paving, or "CORR" for after final surface pavement correction

PT = Pavement type (e.g., "concrete", etc.)

Determine IRIs using the ProVAL ride quality analysis with a 250 mm and IRI filters. While collecting the profile data to determine IRI, record the following locations in the raw profile data:

1. Begin and end of all bridge approach slabs
2. Begin and end of all bridges
3. Begin and end of all culverts visible on the roadway surface

For each 0.1 mile section, your IRI values must be within 10 percent of the Department's IRI values. The Engineer may order you to recalibrate your IP equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your IP operator.

Determine the MRI for 0.1-mile fixed sections. A partial section less than 0.1 mile that is the result of an interruption to continuous pavement surface must comply with the MRI specifications for a full section. Adjust the MRI for a partial section to reflect a full section based on the proportion of a section paved.

Determine the areas of localized roughness. Use the ProVAL smoothness assurance with a continuous IRI for each wheel path, 25-foot interval, and 250 mm and IRI filters.

- 40-1.01D(6)(c)(iv) Reserved
- 40-1.01D(6)(d)–40-1.01D(6)(h) Reserved
- 40-1.01D(7) Pavement Acceptance
- 40-1.01D(7)(a) Acceptance Testing
- 40-1.01D(7)(a)(i) General

The Department's acceptance testing includes testing the pavement properties at the minimum frequencies shown in the following table:

Property	Acceptance Testing Test Method		Frequency ^a
	CRCP	JPCP	
Modulus of rupture (28 day)	California Test 523		1,000 cu yd
Air content ^b	California Test 504		1 day's paving
Dowel bar placement	--	Measurement ^a	700 sq yd
Tie bar placement	--	Measurement ^a	4,000 sq yd
Thickness	California Test 531		1,200 sq yd
Coefficient of friction	California Test 342		1 day's paving

^aA single test represents no more than the frequency specified.

^bTested only when air entrainment is specified.

Pavement smoothness may be accepted based on your testing in the absence of the Department's testing.

40-1.01D(7)(a)(ii) Air Content

If air-entraining admixtures are specified, the Engineer uses a t-test to compare your QC test results with the Department's test results. The t-value for test data is determined using the following equation:

$$t = \frac{|\bar{X}_c - \bar{X}_v|}{S_p \sqrt{\frac{1}{n_c} + \frac{1}{n_v}}} \quad \text{and} \quad S_p^2 = \frac{S_c^2(n_c - 1) + S_v^2(n_v - 1)}{n_c + n_v - 2}$$

where:

- n_c = Number of your quality control tests (minimum of 6 required)
- n_v = Number of Department's tests (minimum of 2 required)
- \bar{X}_c = Mean of your quality control tests
- \bar{X}_v = Mean of the Department's tests
- S_p = Pooled standard deviation
(When $n_v = 1$, $S_p = S_c$)
- S_c = Standard deviation of your quality control tests
- S_v = Standard deviation of the Department's tests (when $n_v > 1$)

The Engineer compares your QC test results with the Department's test results at a level of significance of $\alpha = 0.01$. The Engineer compares the t-value to t_{crit} , using degrees of freedom showing in the following table:

degrees of freedom (nc+nv-2)	tcrit (for $\alpha = 0.01$)
1	63.657
2	9.925
3	5.841
4	4.604
5	4.032
6	3.707
7	3.499
8	3.355
9	3.250
10	3.169

If the t-value calculated is less than or equal to tcrit, your quality control test results are verified. If the t-value calculated is greater than tcrit, quality control test results are not verified.

If your quality control test results are not verified, core at least 3 specimens from concrete pavement under section 40-1.03P. The Engineer selects the core locations. The authorized laboratory must test these specimens for air content under ASTM C 457. The Engineer compares these test results with your quality control test results using the t-test method. If your quality control test results are verified based on this comparison, the Engineer uses the quality control test results for acceptance of concrete pavement for air content. If your quality control test results are not verified based on this comparison, the Engineer uses the air content of core specimens determined by the authorized laboratory under ASTM C 457 for acceptance.

40-1.01D(7)(a)(iii) Dowel and Tie Bar Placement

For JPCP, drill cores under section 40-1.03P for the Department's acceptance testing.

The Engineer identifies which joint and dowel or tie bar are to be tested. Core each day's paving within 2 business days. Each dowel or tie bar test consists of 2 cores, 1 on each bar end to expose both ends and allow measurement.

If the tests indicate dowel or tie bars are not placed within the specified tolerances or if there is unconsolidated concrete around the dowel or tie bars, core additional specimens identified by Engineer to determine the limits of unacceptable work.

40-1.01D(7)(a)(iv) Thickness

Drill cores under section 40-1.03P for the Department's acceptance testing in the primary area, which is the area placed in 1 day for each thickness. Core at locations determined by the Engineer and in the Engineer's presence.

Do not core until any grinding has been completed.

The core specimen diameter must be 4 inches. To identify the limits of concrete pavement deficient in thickness by more than 0.05 foot, you may divide primary areas into secondary areas. The Engineer measures cores under California Test 531 to the nearest 0.01 foot. Core at least 1 foot from existing, contiguous, and parallel concrete pavement not constructed as part of this Contract.

You may request the Engineer make additional thickness measurements and use them to determine the average thickness variation. The Engineer determines the locations with random sampling methods.

If each thickness measurement in a primary area is less than 0.05 foot deficient, the Engineer calculates the average thickness deficiency in that primary area. The Engineer uses 0.02 foot for a thickness difference more than 0.02 foot over the specified thickness.

For each thickness measurement in a primary area deficient by more than 0.05 foot, the Engineer determines a secondary area where the thickness deficiency is more than 0.05 foot. The Engineer determines this secondary area by measuring the thickness of each concrete pavement slab adjacent to

the measurement found to be more than 0.05 foot deficient. The Engineer continues to measure the thickness until an area that is bound by slabs with thickness deficient by 0.05 foot or less is determined.

Slabs without bar reinforcement are defined by the areas bound by longitudinal and transverse joints and concrete pavement edges. Slabs with bar reinforcement are defined by the areas bound by longitudinal joints and concrete pavement edges and 15-foot lengths. Secondary area thickness measurements in a slab determine that entire slab's thickness.

The Engineer measures the remaining primary area thickness after removing the secondary areas from consideration for determining the average thickness deficiency.

40-1.01D(7)(a)(v)–40-1.01D(7)(a)(ix) Reserved

40-1.01D(7)(b) Acceptance Criteria

40-1.01D(7)(b)(i) General

Reserved

40-1.01D(7)(b)(ii) Modulus of Rupture

For field qualification, the modulus of rupture at no later than 28 days must be at least:

1. 550 psi for each single beam
2. 570 psi for the average of 5 beams

For production, the modulus of rupture for the average of the individual test results of 2 beams aged for 28 days must be at least 570 psi.

40-1.01D(7)(b)(iii) Air Content

The air content must be within ± 1.5 percent of the specified value. If no value is specified, the air content must be within ± 1.5 percent of, the value used for your approved mix design.

40-1.01D(7)(b)(iv) Bar Reinforcement

In addition to requirements of Section 52, bar reinforcement must be more than 1/2 inch below the saw cut depth at concrete pavement joints.

40-1.01D(7)(b)(v) Dowel Bar and Tie Bar Placement

Tie bar placement must comply with the tolerances shown in the following table:

Tie Bar Tolerance	
Dimension	Tolerance
Horizontal and vertical skew	5 1/4 inch, max
Longitudinal translation	± 2 inch
Horizontal offset (embedment)	± 2 inch
Vertical depth	<ol style="list-style-type: none"> 1. At least 1/2 inch below the bottom of the saw cut 2. When measured at any point along the bar, not less than 2 inches clear of the pavement's surface and bottom

NOTE: Tolerances are measured relative to the completed joint.

Dowel bar placement must comply with the tolerances shown in the following table:

Dowel Bar Tolerances

Dimension	Tolerance
Horizontal offset	±1 inch
Longitudinal translation	±2 inch
Horizontal skew	5/8 inch, max
Vertical skew	5/8 inch, max
Vertical depth	<p>The minimum distance measured from concrete pavement surface to any point along the top of dowel bar must be: $DB + 1/2$ inch</p> <p>where: DB = one third of pavement thickness in inches, or the saw cut depth, whichever is greater</p> <p>The maximum distance below the depth shown must be 5/8 inch.</p>

NOTE: Tolerances are measured relative to the completed joint.

The Engineer determines the limits for removal and replacement.

40-1.01D(7)(b)(vi) Pavement Thickness

Concrete pavement thickness must not be deficient by more than 0.05 foot.

The minimum thickness is not reduced for specifications that may affect concrete pavement thickness such as allowable tolerances for subgrade construction.

The Engineer determines the areas of noncompliant pavement, the thickness deficiencies, and the limits where removal is required.

Pavement with an average thickness deficiency less than 0.01 foot is acceptable. If the thickness deficiency is 0.01 foot or more and less than 0.05 foot, you may request authorization to leave the pavement in place and accept a pay adjustment. If the deficiency is more than 0.05 foot the pavement must be removed and replaced.

40-1.01D(7)(b)(vii) Pavement Smoothness

Where testing with an IP is required, the pavement surface must have:

1. No areas of localized roughness with an IRI greater than 120 in/mi
2. MRI of 60 in/mi or less within a 0.1 mile section

Where testing with a straightedge is required, the pavement surface must not vary from the lower edge of the straightedge by more than:

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

40-1.01D(7)(b)(viii) Coefficient of Friction

Initial and final texturing must produce a coefficient of friction of at least 0.30. Do not open the pavement to traffic unless the coefficient of friction is at least 0.30.

40-1.01D(7)(b)(ix)–40-1.01D(7)(b)(xii) Reserved

40-1.02 MATERIALS

40-1.02A General

Water for coring must comply with section 90.

Tack coat must comply with section 39.

40-1.02B Concrete

40-1.02B(1) General

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

40-1.02B(2) Cementitious Material

Concrete must contain from 505 pounds to 675 pounds cementitious material per cubic yard. The specifications for reducing cementitious material content in section 90-1.02E(2) do not apply.

40-1.02B(3) Aggregate

Aggregate must comply with section 90-1.02C except the specifications for reduction in operating range and contract compliance for cleanness value and sand equivalent specified in section 90-1.02C(2) and section 90-1.02C(3) do not apply.

For coarse aggregate in high desert and high mountain climate regions, the loss must not exceed 25 percent when tested under California Test 211 with 500 revolutions.

For combined aggregate gradings, the difference between the percent passing the 3/8-inch sieve and the percent passing the no. 8 sieve must not be less than 16 percent of the total aggregate.

40-1.02B(4) Air Entrainment

The second paragraph of section 90-1.02I(2)(a) does not apply.

For a project shown in the low and south mountain climate regions, add air-entraining admixture to the concrete at the rate required to produce an air content of 4 percent in the freshly mixed concrete.

For a project shown in the high desert and high mountain climate regions, add air-entraining admixture to the concrete at the rate required to produce an air content of 6 percent in the freshly mixed concrete.

40-1.02B(5)–40-1.02B(8) Reserved

40-1.02C Reinforcement, Bars, and Baskets

40-1.02C(1) Bar Reinforcement

Bar reinforcement must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, bar reinforcement must comply with section 52.

If the project is shown to be in high desert or any mountain climate regions, bar reinforcement must be one of the following:

1. Epoxy-coated bar reinforcement under section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60. Bars must be handled under ASTM D 3963/D 3963M and section 52-2.02C.
2. Low carbon, chromium steel bar complying with ASTM A 1035/A 1035M

40-1.02C(2) Dowel Bars

Dowel bars must be plain bars. Fabricate, sample, and handle epoxy-coated dowel bars under ASTM D 3963/D 3963M and section 52-2.03C except each sample must be 18 inches long.

If the project is not shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with either section 52-2.02B or 52-2.03B.

2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with section 52-2.03B.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.

40-1.02C(3) Tie Bars

Tie bars must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with either section 52-2.02B or 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.

Fabricate, sample, and handle epoxy-coated tie bars under ASTM D 3963/D 3963M, section 52-2.02, or section 52-2.03.

Do not bend tie bars.

40-1.02C(4) Dowel and Tie Bar Baskets

For dowel and tie bar baskets, wire must comply with ASTM A 82/A 82M and be welded under ASTM A 185/A 185M, Section 7.4. The minimum wire-size no. is W10. Use either U-frame or A-frame shaped assemblies.

If the project is not shown to be in high desert or any mountain climate region, baskets may be epoxy-coated, and the epoxy coating must comply with either section 52-2.02B or 52-2.03B.

If the project is shown to be in high desert or any mountain climate region, wire for dowel bar and tie bar baskets must be one of the following:

1. Epoxy-coated wire complying with section 52-2.03B
2. Stainless-steel wire. Wire must be descaled solid stainless-steel. Wire must comply with (1) the chemical requirements in ASTM A 276/A 276M, UNS Designation S31603 or S31803 and (2) the tension requirements in ASTM A 1022/ A 1022M.

Handle epoxy-coated tie bar and dowel bar baskets under ASTM D 3963/D 3963M and either section 52-2.02 or 52-2.03.

Fasteners must be driven fasteners under ASTM F 1667. Fasteners on lean concrete base or HMA must have a minimum shank diameter of 3/16 inch and a minimum shank length of 2-1/2 inches. For asphalt treated permeable base or cement treated permeable base, the shank diameter must be at least 3/16 inch and the shank length must be at least 5 inches.

Fasteners, clips, and washers must have a minimum 0.2-mil thick zinc coating applied by either electroplating or galvanizing.

40-1.02D Dowel Bar Lubricant

Dowel bar lubricant must be petroleum paraffin based or a curing compound. Paraffin-based lubricant must be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal and must be factory-applied. Curing compound must be curing compound no. 3.

40-1.02E Joint Filler

Joint filler for isolation joint must be preformed expansion joint filler for concrete (bituminous type) under ASTM D 994.

40-1.02F Curing Compound

Curing compound must be curing compound no. 1 or 2.

40-1.02G Nonshrink Hydraulic Cement Grout

Nonshrink hydraulic cement grout must comply with ASTM C 1107/C 1107M. Clean, uniform, rounded aggregate filler may be used to extend the grout. Aggregate filler must not exceed 60 percent of the grout mass or the maximum recommended by the manufacturer, whichever is less. Aggregate filler moisture content must not exceed 0.5 percent when tested under California Test 223 or California Test 226. Aggregate filler tested under California Test 202 must comply with the grading shown in the following table:

Sieve size	Percentage passing
1/2-inch	100
3/8-inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

40-1.02H Temporary Roadway Pavement Structure

Temporary roadway pavement structure must comply with section 41-1.02E.

40-1.02I-40-1.02N Reserved

40-1.03 CONSTRUCTION

40-1.03A General

Aggregate and bulk cementitious material must be proportioned by weight by means of automatic proportioning devices of approved types.

For widenings and lane reconstruction, construct only the portion of pavement where the work will be completed during the same lane closure. If you fail to complete the construction during the same lane closure, construct a temporary pavement structure under section 41-1.

40-1.03B Water Supply

Before placing concrete pavement, develop enough water supply.

40-1.03C Test Strips

Construct a test strip for each type of pavement with a quantity of more than 2,000 cu yd. Obtain authorization of the test strip before constructing pavement. Test strips must be:

1. 700 to 1,000 feet long
2. Same width as the planned paving, and
3. Constructed using the same equipment proposed for paving

The Engineer selects from 6 to 12 core locations for dowel bars and up to 6 locations for tie bars per test strip. If you use mechanical dowel bar inserters, the test strip must demonstrate they do not leave voids, segregations, or surface irregularities such as depressions, dips, or high areas.

Test strips must comply with the acceptance criteria for:

1. Smoothness, except IP is not required
2. Dowel bars and tie bars placement
3. Pavement thickness
4. Final finishing, except the coefficient of friction is not considered

Allow 3 business days for evaluation. If the test strip is noncompliant, stop paving and submit a plan for changed materials, methods, or equipment. Allow 3 business days for authorization of the plan. Construct another test strip per the authorized plan.

Remove and dispose of noncompliant test strips.

If the test strip is compliant except for smoothness and final finishing, you may grind the surface. After grinding retest the test strip smoothness under section 40-1.01D(6)(c).

If the test strip is compliant for smoothness and thickness, construction of an additional test strip is not required and the test strip may remain in place.

Construct additional test strips if you:

1. Propose different paving equipment including:
 - 1.1. Paver
 - 1.2. Dowel bar inserter
 - 1.3. Tie bar inserter
 - 1.4. Tining
 - 1.5. Curing equipment
2. Change concrete mix proportions

You may request authorization to eliminate the test strip if you use paving equipment and personnel from a Department project (1) for the same type of pavement and (2) completed within the past 12 months. Submit supporting documents and previous project information with your request.

40-1.03D Joints

40-1.03D(1) General

Do not bend tie bars or reinforcement in existing concrete pavement joints.

For contraction joints and isolation joints, saw cut a groove with a power-driven saw. After cutting, immediately wash slurry from the joint with water at less than 100 psi pressure.

Keep joints free from foreign material including soil, gravel, concrete, and asphalt. To keep foreign material out of the joint, you may use filler material. Filler material must not react adversely with the concrete or cause concrete pavement damage. After sawing and washing, install filler material that keeps moisture in the adjacent concrete during the 72 hours after paving. If you install filler material, the specifications for spraying the sawed joint with additional curing compound in section 40-1.03K does not apply. If using absorptive filler material, moisten the filler immediately before or after installation.

40-1.03D(2) Construction Joints

Construction joints must be vertical.

Before placing fresh concrete against hardened concrete, existing concrete pavement, or structures, apply curing compound no. 1 or 2 to the vertical surface of the hardened concrete, existing concrete pavement, or structures and allow it to dry.

At joints between concrete pavement and HMA, apply tack coat between the concrete pavement and HMA.

Use a metal or wooden bulkhead to form transverse construction joints. If dowel bars are described, the bulkhead must allow dowel bar installation.

40-1.03D(3) Contraction Joints

Saw contraction joints before cracking occurs and after the concrete is hard enough to saw without spalling, raveling, or tearing.

Saw cut using a power saw with a diamond blade. After cutting, immediately wash slurry from the joint with water at less than 100 psi pressure.

Except for longitudinal joints parallel to a curving centerline, transverse and longitudinal contraction joints must not deviate by more than 0.1 foot from either side of a 12-foot straight line

Cut transverse contraction joints within 0.5 foot of the spacing described. Adjust spacing if needed such that slabs are at least 10 feet long.

For widenings, do not match transverse contraction joints with existing joint spacing or skew unless otherwise described.

Cut transverse contraction joints straight across the full concrete pavement width, between isolation joints and edges of pavement. In areas of converging and diverging pavements, space transverse contraction joints such that the joint is continuous across the maximum pavement width. Longitudinal contraction joints must be parallel with the concrete pavement centerline, except when lanes converge or diverge.

40-1.03D(4) Isolation Joints

Before placing concrete at isolation joints, prepare the existing concrete face and secure joint filler. Prepare by saw cutting and making a clean flat vertical surface. Make the saw cut the same depth as the depth of the new pavement.

40-1.03E Bar Reinforcement

Place bar reinforcement under section 52.

40-1.03F Dowel Bar Placement

If using curing compound as lubricant, apply the curing compound to dowels in 2 separate applications. Lubricate each dowel bar entirely before placement. The last application must be applied not more than 8 hours before placing the dowel bars. Apply each curing compound application at a rate of 1 gallon per 150 square feet.

Install dowel bars using one of the following methods:

1. Drill and bond bars. Comply with section 41-10.
2. Mechanical insertion. Eliminate evidence of the insertion by reworking the concrete over the dowel bars.
3. Dowel bar baskets. Anchor baskets with fasteners. Use at least 1 fastener per foot for basket sections. Baskets must be anchored at least 200 feet in advance of the concrete placement activity unless your waiver request is authorized. If requesting a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before the concrete is placed, cut and remove temporary spacer wires and demonstrate the dowel bars do not move from their specified depth and alignment during concrete placement.

If dowel bars are noncompliant, stop paving activities, demonstrate your correction, and obtain verbal approval from the Engineer.

40-1.03G Tie Bar Placement

Install tie bars at longitudinal joints using one of the following methods:

1. Drill and bond bars. Comply with section 41-10.
2. Insert bars. Mechanically insert tie bars into plastic slip-formed concrete before finishing. Inserted tie bars must have full contact between the bar and the concrete. Eliminate evidence of the insertion by reworking the concrete over the tie bars.
3. Threaded couplers. Threaded tie bar splice couplers must be fabricated from deformed bar reinforcement and free of external welding or machining.
4. Tie bar baskets. Anchor baskets at least 200 feet in advance of pavement placement activity. If you request a waiver, describe the construction limitations or restricted access preventing the advanced

anchoring. After the baskets are anchored and before paving, demonstrate the tie bars do not move from their specified depth and alignment during paving. Use fasteners to anchor tie bar baskets.

If tie bars are noncompliant, stop paving activities, demonstrate your correction, and obtain verbal approval from the Engineer.

40-1.03H Placing Concrete

40-1.03H(1) General

Immediately prior to placing concrete, the surface to receive concrete must be:

1. In compliance with specified requirements, including compaction and elevation tolerances
2. Free of loose and extraneous material
3. Uniformly moist, but free of standing or flowing water

Place concrete pavement with stationary side forms or slip-form paving equipment.

Place consecutive concrete loads within 30 minutes of each other. Construct a transverse construction joint when concrete placement is interrupted by more than 30 minutes. The transverse construction joint must coincide with the next contraction joint location, or you must remove fresh concrete pavement to the preceding transverse joint location.

Place concrete pavement in full slab widths separated by construction joints or monolithically in multiples of full lane widths with a longitudinal contraction joint at each traffic lane line.

Do not retemper concrete.

If the concrete pavement surface width is constructed as specified, you may construct concrete pavement sides on a batter not flatter than 6:1 (vertical:horizontal).

40-1.03H(2) Paving Adjacent to Existing Concrete Pavement

Where pavement is placed adjacent to existing concrete pavement:

1. Grinding adjacent pavement must be completed before placing the pavement
2. Use paving equipment with padded crawler tracks or rubber-tired wheels with enough offset to prevent damage
3. Match pavement grade with the elevation of existing concrete pavement after grinding.

40-1.03H(3) Concrete Pavement Transition Panel

For concrete pavement placed in a transition panel, texture the surface with a drag strip of burlap, broom, or spring steel tine device that produces scoring in the finished surface. Scoring must be either parallel or transverse to the centerline. Texture at the time that produces the coarsest texture.

40-1.03H(4) Stationary Side Form Construction

Stationary side forms must be straight and without defects including warps, bends, and indentations. Side forms must be metal except at end closures and transverse construction joints where other materials may be used.

You may build up side forms by attaching a section to the top or bottom. If attached to the top of metal forms, the attached section must be metal.

The side form's base width must be at least 80 percent of the specified concrete pavement thickness.

Side forms including interlocking connections with adjoining forms must be rigid enough to prevent springing from subgrading and paving equipment and concrete pressure.

Construct subgrade to final grade before placing side forms. Side forms must bear fully on the foundation throughout their length and base width. Place side forms to the specified grade and alignment of the finished concrete pavement's edge. Support side forms during concrete placing, compacting, and finishing.

After subgrade work is complete and immediately before placing concrete, true side forms and set to line and grade for a distance that avoids delays due to form adjustment.

Clean and oil side forms before each use.

Side forms must remain in place for at least 1 day after placing concrete and until the concrete pavement edge no longer requires protection from the forms.

Spread, screed, shape, and consolidate concrete with 1 or more machines. The machines must uniformly distribute and consolidate the concrete. The machines must operate to place the concrete pavement to the specified cross section with minimal hand work.

Consolidate the concrete without segregation. If vibrators are used:

1. The vibration rate must be at least 3,500 cycles per minute for surface vibrators and 5,000 cycles per minute for internal vibrators
2. Amplitude of vibration must cause perceptible concrete surface movement at least 1 foot from the vibrating element
3. Use a calibrated tachometer for measuring frequency of vibration
4. Vibrators must not rest on side forms or new concrete pavement
5. Power to vibrators must automatically cease when forward or backward motion of the paving machine is stopped
6. Uniformly consolidate the concrete across the paving width including adjacent to forms by using high-frequency internal vibrators within 15 minutes of depositing concrete on the subgrade
7. Do not shift the mass of concrete with vibrators.

40-1.03H(5) Slip-Form Construction

If slip-form construction is used, spread, screed, shape, and consolidate concrete to the specified cross section with slip-form machines and minimal hand work. Slip-form paving machines must be equipped with traveling side forms and must not segregate the concrete.

Do not deviate from the specified concrete pavement alignment by more than 0.1 foot.

Slip-form paving machines must use high frequency internal vibrators to consolidate concrete. You may mount vibrators with their axes parallel or normal to the concrete pavement alignment. If mounted with axes parallel to the concrete pavement alignment, space vibrators no more than 2.5 feet measured center to center. If mounted with axes normal to the concrete pavement alignment, space the vibrators with a maximum 0.5-foot lateral clearance between individual vibrators.

Each vibrator must have a vibration rate from 5,000 to 8,000 cycles per minute. The amplitude of vibration must cause perceptible concrete surface movement at least 1 foot from the vibrating element. Use a calibrated tachometer to measure frequency of vibration.

40-1.03I Edge Treatment

Construct edge treatments as shown. Regrade when required for the preparation of safety edge areas.

Sections 40-1.03J(2) and 40-1.03J(3) do not apply to safety edges.

For safety edges placed after the concrete pavement is complete, concrete may comply with the requirements for minor concrete.

For safety edges placed after the concrete pavement is complete, install connecting bar reinforcement under section 52.

Saw cutting or grinding may be used to construct safety edges.

For safety edges, the angle of the slope must not deviate by more than ± 5 degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

40-1.03J Finishing

40-1.03J(1) General

Reserved

40-1.03J(2) Preliminary Finishing

40-1.03J(2)(a) General

Preliminary finishing must produce a smooth and true-to-grade finish. After preliminary finishing, mark each day's paving with a stamp. The stamp must be authorized before paving starts. The stamp must be approximately 1 by 2 feet in size. The stamp must form a uniform mark from 1/8 to 1/4 inch deep. Locate the mark 20 ± 5 feet from the transverse construction joint formed at each day's start of paving and 1 ± 0.25 foot from the pavement's outside edge. The stamp mark must show the month, day, and year of placement and the station of the transverse construction joint. Orient the stamp mark so it can be read from the pavement's outside edge.

Do not apply water to the pavement surface before float finishing.

40-1.03J(2)(b) Stationary Side Form Finishing

If stationary side form construction is used, give the pavement a preliminary finish by the machine float method or the hand method.

If using the machine float method:

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

If using the hand method, finish pavement smooth and true to grade with manually operated floats or powered finishing machines.

40-1.03J(2)(c) Slip-Form Finishing

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

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

40-1.03J(3) Final Finishing

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

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

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

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

For irregular areas and areas inaccessible to the grooving machine, you may hand-construct grooves using the hand method. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

For ramp termini, use heavy brooming normal to the ramp centerline to produce a coefficient of friction of at least 0.35 determined on the hardened surface under California Test 342.

40-1.03K Curing

Cure the concrete pavement's exposed area under section 90-1.03B using the waterproof membrane method or curing compound method. If using the curing compound method use curing compound no. 1 or 2. When side forms are removed within 72 hours of the start of curing, also cure the concrete pavement edges.

Apply curing compound with mechanical sprayers. Reapply curing compound to saw cuts and disturbed areas.

40-1.03L Protecting Concrete Pavement

Protect concrete pavement under section 90-1.03C.

Maintain the concrete pavement surface temperature at not less than 40 degrees F for the initial 72 hours.

Protect the concrete pavement surface from activities that cause damage and reduce texture and coefficient of friction. Do not allow soil, gravel, petroleum products, concrete, or asphalt mixes on the concrete pavement surface.

Construct crossings for traffic convenience. If authorized, you may use RSC for crossings. Do not open crossings until the Department determines that the pavement's modulus of rupture is at least 550 psi under California Test 523 or California Test 524.

Do not open concrete pavement to traffic or use equipment on the concrete pavement for 10 days after paving nor before the concrete has attained a modulus of rupture of 550 psi based on Department's testing except:

1. If the equipment is for sawing contraction joints
2. If authorized, one side of paving equipment's tracks may be on the concrete pavement after a modulus of rupture of 350 psi has been attained, provided:
 - 2.1. Unit pressure exerted on the concrete pavement by the paver does not exceed 20 psi
 - 2.2. You change the paving equipment tracks to prevent damage or the paving equipment tracks travel on protective material such as planks
 - 2.3. No part of the track is closer than 1 foot from the concrete pavement's edge

If concrete pavement damage including visible cracking occurs, stop operating paving equipment on the concrete pavement and repair the damage.

40-1.03M Early Use of Concrete Pavement

If requesting early use of concrete pavement:

1. Furnish molds and machines for modulus of rupture testing
2. Sample concrete
3. Fabricate beam specimens
4. Test for modulus of rupture under California Test 523

If you request early use, concrete pavement must have a modulus of rupture of at least 350 psi. Protect concrete pavement under section 40-1.03L.

40-1.03N Reserved

40-1.03O Shoulder Rumble Strip

40-1.03O(1) General

Construct shoulder rumble strips by rolling or grinding indentations in new concrete pavement.

Do not construct shoulder rumble strips on structures or approach slabs.

Construct rumble strips within 2 inches of the specified alignment. Rumble strip equipment must be equipped with a sighting device enabling the operator to maintain the rumble strip alignment.

Indentations must not vary from the specified dimensions by more than 1/16 inch in depth nor more than 10 percent in length and width.

Grind or remove and replace noncompliant rumble strip indentations at locations determined by the Engineer. Ground surface areas must be neat and uniform in appearance.

Remove grinding residue under section 42-1.03B.

40-1.03O(2) Rolled-In Indentations

Construct rolled-in indentations before final concrete set. Indentation construction must not displace adjacent concrete.

40-1.03O(3) Ground-In Indentations

Concrete pavement must be hardened before grinding rumble strips indentations. Do not construct indentations until the following occurs:

1. 10 days elapse after concrete placement
2. Concrete has developed a modulus of rupture of 550 psi determined under California Test 523,

40-1.03P Drilling Cores

Drill concrete pavement cores under ASTM C 42/C 42M. Use diamond impregnated drill bits.

Clean, dry, and fill core holes with hydraulic cement grout (nonshrink) or pavement concrete. Coat the core hole walls with epoxy adhesive for bonding new concrete to old concrete under section 95. Finish the backfill to match the adjacent surface elevation and texture.

40-1.03Q Pavement Repair and Replacement

40-1.03Q(1) General

If surface raveling or full-depth cracks occur within one year of Contract acceptance, repair or replace the pavement under section 6-3.06.

Repair and replace pavement in the following sequence:

1. Replace pavement
2. Repair spall, ravel, and working cracks
3. Correct smoothness and coefficient of friction
4. Treat partial depth cracks
5. Replace damaged joint seals under section 41-5

In addition to removing pavement for other noncompliance, remove and replace JPCP slabs that:

1. Have one or more full depth crack
2. Have raveled surfaces such that either:
 - 2.1. Combined raveled areas are more than 5 percent of the total slab area
 - 2.2. Single area is more than 4 sq ft

Remove and replace JPCP 3 feet on both sides of a joint with a rejected dowel bar.

40-1.03Q(2) Spall and Ravel Repair

Repair spalled or raveled areas that are:

1. Deeper than 0.05 foot
2. Wider than 0.10 foot
3. Longer than 0.3 foot

Repairs must comply with section 41-4 and be completed before opening pavement to traffic.

40-1.03Q(3) Crack Repair

Treat partial depth cracks for JPCP under section 41-3.

If the joints are sealed, repair working cracks by routing and sealing. Use a powered rotary router mounted on wheels, with a vertical shaft and a routing spindle that casters as it moves along the crack. Form a reservoir 3/4 inch deep by 3/8 inch wide in the crack. Equipment must not cause raveling nor spalling

Treat the contraction joint adjacent to the working crack by either:

1. Epoxy resin under ASTM C 881/C 881M, Type IV, Grade 2
2. Pressure injecting epoxy resin under ASTM C 881/C881M, Type IV, Grade 1

40-1.03Q(4) Smoothness and Friction Correction

Correct pavement that is noncompliant for:

1. Smoothness by grinding under section 42-3
2. Coefficient of friction by grooving or grinding under section 42

Do not start corrective work until:

1. Pavement has cured 10 days
2. Pavement has at least a 550 psi modulus of rupture
3. Your corrective method is authorized

Correct the entire lane width. Begin and end grinding at lines perpendicular to the roadway centerline. The corrected area must have a uniform texture and appearance.

If corrections are made within areas where testing with an IP is required, retest the entire lane length with an IP under sections 40-1.01D(6)(c) and 40-1.01D(7)(b)(vii).

If corrections are made within areas where testing with a 12-foot straightedge is required, retest the corrected area with a straightedge under sections 40-1.01D(6)(c) and 40-1.01D(7)(b)(vii).

Allow 25 days for the Department's coefficient of friction retesting.

40-1.03R–40-1.03U Reserved

40-1.04 PAYMENT

The payment quantity for pavement is based on the dimensions shown.

The deduction for pavement thickness deficiency in each primary area is shown in the following table:

Average thickness deficiency (foot) ^a	Deduction(\$/sq yd)
0.01	0.90
0.02	2.30
0.03	4.10
0.04	6.40
0.05	9.11

^aValues greater than 0.01 are rounded to the nearest 0.01 foot.

Shoulder rumble strips are measured by the station along each shoulder on which the rumble strips are constructed without deductions for gaps between indentations.

If the initial cores show that dowel bars or tie bars are within alignment tolerances and the Engineer orders more dowel or tie bar coring, the additional cores are paid for as change order work.

The Department does not pay for additional coring to check dowel or tie bar alignment which you request.

If the Engineer accepts a test strip and it remains as part of the paving surface, the test strip is paid for as the type of pavement involved.

If the curvature of a slab affects tie bar spacing and additional tie bars are required, no additional payment is made for the additional tie bars.

Payment for grinding existing pavement is not included in the payment for the type of pavement involved.

40-2 CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

40-2.01 GENERAL

40-2.01A Summary

Section 40-2 includes specifications for constructing CRCP.

Terminal joints include saw cutting, dowel bars, drill and bond dowel bars, support slab, support slab reinforcement, tack coat, and temporary hot mix asphalt.

Expansion joints include polystyrene, support slab, support slab reinforcement, dowel bars, drill and bond dowel bars, and bond breaker.

Wide flange beam terminals include polyethylene foam, support slab, and support slab reinforcement.

Pavement anchors include cross drains, anchor reinforcement, filter fabric, and permeable material.

40-2.01B Definitions

Reserved

40-2.01C Submittals

Reserved

40-2.01D Quality Control and Assurance

40-2.01D(1) General

Reserved

40-2.01D(2) Testing for Coefficient of Thermal Expansion

For field qualification, test coefficient of thermal expansion under AASHTO T 336. The coefficient of thermal expansion must not exceed 6.0 microstrain/degree Fahrenheit.

40-2.02 MATERIALS

40-2.02A General

Class 1 permeable material, filter fabric, and slotted plastic pipe cross drain as shown for pavement anchors must comply with section 68-3.

40-2.02B Concrete

Concrete for terminal joints, support slabs, and pavement anchors must comply with section 40-1.02.

40-2.02C Transverse Bar Assembly

Instead of transverse bar and other support devices, you may use transverse bar assemblies to support longitudinal bar. Bar reinforcement and wire must comply with section 40-1.02C.

40-2.02D Wide Flange Beam

Wide flange beams and studs must be either rolled structural steel shapes under ASTM A 36/A 36M or structural steel under ASTM A 572/A 572M.

40-2.02E Joints

Joint seals for wide flange beam terminals must comply with section 51-2.02.

Joint seals for transverse expansion joints must comply with section 51-2.02.

Expanded polystyrene for transverse expansion joints must comply with section 51-2.01B(1).

40-2.03 CONSTRUCTION

40-2.03A General

Reserved

40-2.03B Test Strips

Comply with section 40-1.03C except during the evaluation, the Engineer visually checks reinforcement, dowel and tie bar placement.

40-2.03C Construction Joints

Transverse construction joints must be perpendicular to the lane line. Construct joints to allow for lap splices of the longitudinal bar. Comply with the lap splice lengths shown for CRCP.

Clean construction joint surfaces before placing fresh concrete against the joint surfaces. Remove surface laitance, curing compound, and other foreign materials.

40-2.03D Bar Reinforcement

Place bar reinforcement under section 52-1.03D, except you may request to use plastic chairs. Plastic chairs will only be considered for support directly under the transverse bars. Your request to use plastic chairs must include a sample of the plastic chair, the manufacturer's written recommendations for the applicable use and load capacity, chair spacing, and your calculation for the load on a chair for the area of bar reinforcement sitting on it. Vertical and lateral stability of the bar reinforcement and plastic chairs must be demonstrated during construction of the test strip. Obtain authorization before using the proposed plastic chairs for work after the test strip is accepted.

For transverse bar in a curve with a radius under 2,500 feet, place the reinforcement in a single continuous straight line across the lanes and aligned with the radius point as shown.

40-2.03E Wide Flange Beams

Weld stud ends with an electric arc welder completely fusing the studs to the wide flange beam. Replace studs dislodged in shipping or that can be dislodged with a hammer.

40-2.03F Repair and Replacement

40-2.03F(1) General

Requirements for repair of cracks under section 40-1.03Q do not apply to CRCP. High molecular weight methacrylate is not to be applied to cracks in CRCP.

New CRCP will be monitored for 1 year from contract acceptance or relief from maintenance, whichever is less. CRCP that develops raveling areas of 6 inches by 6 inches or greater will require partial depth repair under section 6-3.06. CRCP that develops one or more full-depth transverse cracks with faulting greater than 0.25 inch or one or more full-depth longitudinal cracks with faulting greater 0.50 inch will require full depth repair.

40-2.03F(2) Partial Depth Repair

Partial depth repair must comply with section 41-4 except:

1. Determine a rectangular boundary which extends 6 inches beyond the damaged area. The limits of saw depth must be between 2 inches from the surface to 1/2 inch above the longitudinal bars.
2. If each length of the repair boundaries is equal to or greater than 3 ft, additional reinforcement is needed for the repair area. Submit a plan for authorization before starting the repair.

40-2.03F(3) Full Depth Repair

40-2.03F(3)(a) General

Removal of CRCP must be full depth except for portion of reinforcement to remain. Provide continuity of reinforcement. Comply with section 52-6. Submit a plan for authorization, before starting the repair. Do not damage the base, concrete and reinforcement to remain. Place concrete in the removal area.

40-2.03F(3)(b) Transverse Cracks

Make initial full-depth transverse saw cuts normal to the lane line a distance of 3 feet on each side of the transverse crack.

40-2.03F(3)(c) Longitudinal Cracks

Remove the cracked area normal to the lane line for the full width of the lane a distance of 1 foot beyond the ends of the crack. You may propose alternate limits with your repair plan for authorization.

40-2.03G Reserved

40-2.04 PAYMENT

Not Used

40-3 RESERVED

40-4 JOINTED PLAIN CONCRETE PAVEMENT

40-4.01 GENERAL

40-4.01A Summary

Section 40-4 includes specifications for constructing JPCP.

40-4.01B Definitions

Reserved

40-4.01C Submittals

40-4.01C(1) General

Reserved

40-4.01C(2) Early Age Crack Mitigation System

At least 24 hours before each paving shift, submit the following information as an informational submittal:

1. Early age stress and strength predictions
2. Scheduled sawing and curing activities
3. Contingency plan if cracking occurs

40-4.01C(3)–40-4.01C(8) Reserved

40-4.01D Quality Control and Assurance

40-4.01D(1) General

Reserved

40-4.01D(2) Quality Control Plan

The QC plan must include a procedure for identifying transverse contraction joint locations relative to the dowel bars longitudinal center and a procedure for consolidating concrete around the dowel bars.

40-4.01D(3) Early Age Crack Mitigation System

For JPCP, develop and implement a system for predicting stresses and strength during the initial 72 hours after paving. The system must include:

1. Subscription to a weather service to obtain forecasts for wind speed, ambient temperatures, humidity, and cloud cover
2. Portable weather station with an anemometer, temperature and humidity sensors, located at the paving site
3. Early age concrete pavement stress and strength prediction plan
4. Analyzing, monitoring, updating, and reporting the system's predictions

40-4.01D(4)–40-4.01D(9) Reserved

40-4.02 MATERIALS

Not Used

40-4.03 CONSTRUCTION

40-4.03A General

Transverse contraction joints on a curve must be on a single straight line through the curve's radius point. If transverse joints do not align in a curve, drill a full depth 2" diameter hole under ASTM C 42/C 42M where the joint meets the adjacent slab. Fill the hole with joint filler. If joints are not sealed, avoid joint filler material penetration into the joint.

40-4.03B Repair and Replacement

If replacing concrete, saw cut and remove to full depth.

Saw cut full slabs at the longitudinal and transverse joints. Saw cut partial slabs at joints and at locations determined by the Engineer. Saw cut must be vertical.

After lifting the slab, paint the cut ends of dowels and tie bars.

Construct transverse and longitudinal construction joints between the new slab and existing concrete. If slabs are constrained at both longitudinal edges by existing pavement, use dowel bars instead of tie bars. For longitudinal joints, offset dowel bar holes from original tie bars by 3 inches. For transverse joints, offset dowel bar holes from the original dowel bar by 3 inches.

Drill and bond bars to the existing concrete. Comply with section 41-10. Clean the faces of joints and underlying base from loose material and contaminants. Coat the faces with a double application of pigmented curing compound under section 28-2.03F. For partial slab replacements, place preformed sponge rubber expansion joint filler at new transverse joints under ASTM D 1752. Place concrete in the removal area.

40-4.03C-40-4.03G Reserved

40-4.04 PAYMENT

Not Used

40-5 JOINTED PLAIN CONCRETE PAVEMENT WITH RAPID STRENGTH CONCRETE

Reserved

40-6-40-15 RESERVED

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41 CONCRETE PAVEMENT REPAIR

07-19-13

Replace the headings and paragraphs in section 41 with:

07-19-13

41-1 GENERAL

41-1.01 GENERAL

41-1.01A Summary

Section 41-1 includes general specifications for repairing concrete pavement.

Dowel bars must comply with section 40-1.

41-1.01B Definitions

Reserved

41-1.01C Submittals

At least 15 days before delivering fast-setting concrete, polyester resin binder, or bonding agent to the job site, submit the manufacturer's recommendations, instructions, and MSDS. Notify the Engineer if polyester resin binder will be stored in containers over 55 gallons.

41-1.01D Quality Control and Assurance

41-1.01D(1) General

Before using polyester concrete, allow 14 days for sampling and testing of the polyester resin binder.

41-1.01D(2) Reserved

41-1.02 MATERIALS

41-1.02A General

Water for washing aggregates, mixing concrete, curing, and coring must comply with section 90-1.02D.

Use the minimum amount of water to produce workable concrete and comply with the manufacturer's instructions.

41-1.02B Fast-Setting Concrete

Fast-setting concrete must be one of the following:

1. Magnesium phosphate concrete that is either:
 - 1.1. Single component water activated
 - 1.2. Dual component with a prepackaged liquid activator
2. Modified high-alumina based concrete
3. Portland cement based concrete

Fast-setting concrete must be stored in a cool and dry environment.

If used, the addition of retarders must comply with the manufacturer's instructions.

You may use any accelerating chemical admixtures complying with ASTM C494/C494M, Type C and section 90-1.02E.

Fast-setting concrete properties must have the values shown in the following table:

Fast-Setting Concrete

Property	Test method	Value
Compressive strength ^a (psi, min)		
at 3 hours	California Test 551	3,000
at 24 hours	California Test 551	5,000
Flexural strength ^a (psi, min, at 24 hours)	California Test 551	500
Bond strength ^a (psi, min, at 24 hours)		
Saturated surface dry concrete	California Test 551	300
Dry concrete	California Test 551	400
Water absorption (% , max)	California Test 551	10
Abrasion resistance ^a (g, max, at 24 hours)	California Test 550	25
Drying shrinkage (% , max, at 4 days)	ASTM C596	0.13
Water soluble chlorides ^b (% , max, by weight)	California Test 422	0.05
Water soluble sulfates ^b (% , max, by weight)	California Test 417	0.25
Thermal stability (% , min)	California Test 553	90

^aPerform test with aggregate filler if used.

^bTest must be performed on a cube specimen, fabricated under California Test 551, cured at least 14 days, and then pulverized to 100% passing the no. 50 sieve.

Aggregate filler may be used to extend prepackaged concrete. Aggregate filler must:

1. Be clean and uniformly rounded.
2. Have a moisture content of 0.5-percent by weight or less when tested under California Test 226.
3. Comply with sections 90-1.02C(2) and 90-1.02C(3).
4. Not exceed 50 percent of the concrete volume or the maximum recommended by the fast-setting concrete manufacturer, whichever is less.

When tested under California Test 202, aggregate filler must comply with the grading in the following table:

Aggregate Filler Grading

Sieve size	Percentage passing
3/8 inch	100
No. 4	50-100
No. 16	0-5

41-1.02C Polyester Concrete

Polyester concrete consists of polyester resin binder and dry aggregate. The polyester resin binder must be an unsaturated isophthalic polyester-styrene copolymer.

Polyester resin binder properties must have the values shown in the following table:

Polyester Resin Binder

Property	Test method	Value
Viscosity ^a (Pa·s) RVT, No. 1 spindle, 20 RPM at 77 °F	ASTM D2196	0.075– 0.200
Specific gravity ^a (77 °F)	ASTM D1475	1.05–1.10
Elongation (% min) Type I specimen, 0.25 ± 0.03 inch thick Speed of testing = 0.45 inch/minute Condition 18/25/50+5/70: T—23/50	ASTM D638	35
Tensile strength (psi, min) Type I specimen, 0.25 ± 0.03 inch thick Speed of testing = 0.45 inch/minute Condition 18/25/50+5/70: T—23/50	ASTM D638	2,500
Styrene content ^a (% by weight)	ASTM D2369	40–50
Silane coupler (% min, by weight of polyester resin binder)	--	1.0
PCC saturated surface-dry bond strength at 24 hours and 70 ± 2 °F (psi, min)	California Test 551	500
Static volatile emissions ^a (g/sq m, max)	South Coast Air Quality Management District, Method 309-91 ^b	60

^aPerform the test before adding initiator.

^bFor the test method, go to:

<http://www.aqmd.gov/tao/methods/lab/309-91.pdf>

Silane coupler must be an organosilane ester, gamma-methacryloxypropyltrimethoxysilane. Promoter must be compatible with suitable methyl ethyl ketone peroxide (MEKP) and cumene hydroperoxide (CHP) initiators.

Aggregate for polyester concrete must comply with section 90-1.02C(1), 90-1.02C(2), and 90-1.02C(3).

When tested under California Test 202, the combined aggregate grading must comply with one of the gradations in the following table:

Sieve size	Combined Aggregate Grading		
	Percentage passing		
	A	B	C
1/2"	100	100	100
3/8"	83–100	100	100
No. 4	65–82	62–85	45–80
No. 8	45–64	45–67	35–67
No. 16	27–48	29–50	25–50
No. 30	12–30	16–36	15–36
No. 50	6–17	5–20	5–20
No. 100	0–7	0–7	0–9
No. 200	0–3	0–3	0–6

Aggregate retained on the no. 8 sieve must have a maximum of 45 percent crushed particles under California Test 205. Fine aggregate must be natural sand.

The weighted average absorption must not exceed 1 percent when tested under California Tests 206 and 207.

You may submit an alternative grading or request to use manufactured sand as fine aggregate but 100 percent of the combined grading must pass the 3/8 inch sieve. Allow 21 days for authorization.

Polyester concrete must have a minimum compressive strength of 1250 psi at 3 hours and 30 minutes under California Test 551 or ASTM C109.

41-1.02D Bonding Agent

Bonding agent must comply with the concrete manufacturer's recommendations.

41-1.02E Temporary Pavement Structure

Temporary pavement structure consists of RSC or aggregate base with HMA. RSC not conforming to the specifications may serve as temporary pavement structure if:

1. The modulus of rupture is at least 200 psi before opening to traffic
2. RSC thickness is greater than or equal to the existing concrete pavement surface layer
3. RSC is replaced during the next paving shift

Aggregate base for temporary pavement structure must comply with the 3/4-inch maximum grading specified in section 26-1.02B.

HMA must comply with section 39-1.15 except do not use HMA Type B.

41-1.02F Reserved

41-1.03 CONSTRUCTION

41-1.03A General

Repair only the portion of pavement where the work will be completed during the same lane closure. If removal is required, remove only the portion of pavement where the repair will be completed during the same traffic closure. Completion of concrete repair includes curing until the concrete attains the specified minimum properties required before opening the repaired pavement to traffic.

If you fail to complete the concrete pavement repair during the same lane closure, construct temporary pavement before opening the lane to traffic.

Before starting repair work, except saw cutting: the equipment, materials, and personnel for constructing temporary pavement structure must be at the job site or an approved location. If HMA can be delivered to the job site within 1 hour, you may request 1-hour delivery as an alternative to having the HMA at the job site.

Maintain the temporary pavement structure and replace it as a first order of work as soon as you resume concrete pavement repair work.

After removing temporary pavement structure, you may stockpile that aggregate base at the job site and reuse it for temporary pavement structure.

41-1.03B Mixing and Applying Bonding Agent

Mix and apply the bonding agent at the job site under the manufacturer's instructions and in small quantities.

Apply bonding agent after cleaning the surface and before placing concrete.

Apply a thin, even coat of bonding agent with a stiff bristle brush until the entire repair surface is scrubbed and coated with bonding agent.

41-1.03C Mixing Concrete

41-1.03C(1) General

Mix concrete in compliance with the manufacturer's instructions. For repairing spalls, mix in a small mobile drum or paddle mixer. Comply with the manufacturer's recommended limits for the quantity of aggregate filler, water, and liquid activator.

Mix the entire contents of prepackaged dual-component magnesium phosphate concrete as supplied by the manufacturer. Use the full amount of each component and do not add water to dual-component magnesium phosphate concrete.

Magnesium phosphate concrete must not be mixed in containers or worked with tools containing zinc, cadmium, aluminum, or copper.

Modified high-alumina based concrete must not be mixed in containers or worked with tools containing aluminum.

41-1.03C(2) Polyester Concrete

When mixing with resin, the moisture content of the combined aggregate must not exceed 1/2 of the average aggregate absorption when tested under California Test 226.

Proportion the polyester resin and aggregate to produce a mixture with suitable workability for the intended work. Only a minimal amount of resin may rise to the surface after finishing.

41-1.03D Placing Concrete

The pavement surface temperature must be at least 40 degrees F before placing concrete. You may propose methods to heat the surfaces.

Place magnesium phosphate concrete on a dry surface.

Place portland cement and modified high-alumina concrete on surfaces treated with a bonding agent recommended by the concrete manufacturer. If no bonding agent is recommended by the manufacturer, place concrete on damp surfaces that are not saturated.

Do not retemper concrete. Use dry finishing tools cleaned with water before working the concrete.

41-1.03E Curing Concrete

Cure concrete under the manufacturer's instructions. When curing compound is used, comply with section 90-1.03B for curing compound no. 1 or 2.

41-1.03F Reserved

41-1.04 PAYMENT

Not Used

41-2 SUBSEALING AND JACKING

41-2.01 GENERAL

41-2.01A Summary

Section 41-2 includes specifications for filling voids under existing concrete pavement.

41-2.01B Definitions

Reserved

41-2.01C Submittals

Submit shipping invoices with packaged or bulk fly ash and cement.

Before grouting activities begin, submit a proposal for the materials to be used. Include authorized laboratory test data for the grout indicating:

1. Time of initial setting under ASTM C266.
2. Compressive strength results at 1, 3, and 7 days for 10, 12, and 14-second grout efflux times.

If requesting a substitution of grout materials, submit a proposal that includes test data.

41-2.01D Quality Control and Assurance

Reserved

41-2.02 MATERIALS

41-2.02A General

Reserved

41-2.02B Grout

Grout must consist of Type II portland cement, fly ash, and water. Use from 2.4 to 2.7 parts fly ash to 1 part portland cement by weight. Use enough water to produce the following grout efflux times determined under California Test 541, Part D:

1. From 10 to 16 seconds for subsealing
2. From 10 to 26 seconds for jacking

Cement for grout must comply with the specifications for Type II portland cement in section 90-1.02B(2).

Fly ash must comply with AASHTO M 295, Class C or Class F. Fly ash sources must be on the Authorized Material List.

You may use chemical admixtures and calcium chloride. Chemical admixtures must comply with section 90-1.02E(2). Calcium chloride must comply with ASTM D98.

Test grout compressive strength under California Test 551, Part 1 at 7-days with 12 seconds efflux time. Follow the procedures for moist cure. The 7-day compressive strength must be at least 750 psi.

41-2.02C Mortar

Mortar must be a prepackaged fast-setting mortar that complies with ASTM C928.

41-2.02D Reserved

41-2.03 CONSTRUCTION

41-2.03A General

Drill holes in the pavement, inject grout, plug the holes, and finish the holes with mortar.

Drill holes through the pavement and underlying base to a depth from 15 to 18 inches below the pavement surface. The hole diameter must match the fitting for the grout injecting equipment.

41-2.03B Injecting Grout

41-2.03B(1) General

Inject grout within 2 days of drilling holes.

Immediately before injecting grout, clean the drilled holes with water at a minimum pressure of 40 psi. The cleaning device must have at least 4 jets that direct water horizontally at the slab-base interface.

Do not inject grout if the atmospheric or subgrade temperature is below 40 degrees F. Do not inject grout in inclement weather. If water is present in the holes, obtain the Engineer's authorization before injecting grout.

Do not inject grout until at least 2 consecutive slabs requiring subsealing are drilled ahead of the grouting activities.

The grout plant must have a positive displacement cement injection pump and a high-speed colloidal mixer capable of operating from 800 to 2,000 rpm. The injection pump must sustain 150 psi if pumping grout with a 12-second efflux time. A pressure gauge must be located immediately adjacent to the supply valve of the grout hose supply valve and positioned for easy monitoring.

Before mixing, weigh dry cement and fly ash if delivered in bulk. If the materials are packaged, each container must weigh the same.

Introduce water to the mixer through a meter or scale.

Inject grout under pressure until the voids under the pavement slab are filled. The injection nozzle must not leak. Do not inject grout if the nozzle is below the bottom of the slab. Inject grout 1 hole at a time.

Stop injecting grout in a hole if either:

1. Grout does not flow under a sustained pump gauge pressure of 150 psi after 7 seconds and there is no indication the slab is moving.
2. Injected grout rises to the surface at any joint or crack, or flows into an adjacent hole.

Dispose of unused grout within 1 hour of mixing.

41-2.03B(2) Subsealing

If a slab raises more than 1/16 inch due to grout injection, stop injecting grout in that hole.

41-2.03B(3) Jacking

The positive displacement pump used for grout injection must be able to provide a sustained gauge pressure of 200 psi. Gauge pressures may be from 200 to 600 psi for brief periods to start slab movement.

You may add additional water to initiate pressure injection of grout. Do not reduce the grout efflux time below 10 seconds.

Raise the slabs uniformly. Use string lines to monitor the pavement movement.

Do not move adjacent slabs not specified for pavement jacking. If you move adjacent slabs, correct the grade within the tolerances for final pavement elevation.

41-2.03B(4) Finishing

Immediately after removing the injection nozzle, plug the hole with a round, tapered wooden plug. Do not remove plugs until adjacent holes are injected with grout and no grout surfaces through previously injected holes.

After grouting, remove grout from drilled holes at least 4 inches below the pavement surface. Clean holes and fill with mortar. Finish filled holes flush with the pavement surface.

41-2.03B(5) Tolerances

The final pavement elevation must be within 0.01 foot of the required grade. If the final pavement elevation is between 0.01 and 0.10 foot higher than the required grade, grind the noncompliant pavement surface under section 42 to within 0.01 foot of the required grade.

If the final pavement elevation is higher than 0.10 foot from the required grade, remove and replace the noncompliant pavement under section 41-9.

41-2.04 PAYMENT

The payment quantity for subsealing is calculated by adding the dry weight of cement and fly ash used for the placed grout. The payment quantity for jacking is calculated by adding the dry weight of cement and fly ash used for the placed grout.

The Department does not pay for wasted grout.

The Department does not adjust the unit price for an increase or decrease in the subsealing quantity.

The Department does not adjust the unit price for an increase or decrease in the jacking quantity.

41-3 CRACK TREATMENT

41-3.01 GENERAL

41-3.01A Summary

Section 41-3 includes specifications for applying high-molecular-weight methacrylate (HMWM) to concrete pavement surface cracks that do not extend the full slab depth.

41-3.01B Definitions

Reserved

41-3.01C Submittals

41-3.01C(1) General

Submit HMWM samples 20 days before use.

If sealant is to be removed, submit the proposed removal method at least 7 days before sealant removal. Do not remove sealant until the proposed sealant removal method is authorized.

41-3.01C(2) Public Safety and Placement Plans

Before starting crack treatment, submit a public safety plan for HMWM and a placement plan for construction activity as shop drawings.

The public safety and placement plans must identify the materials, equipment, and methods to be used.

In the public safety plan, include the MSDS for each component of HMWM and details for:

1. Shipping
2. Storage
3. Handling
4. Disposal of residual HMWM and containers

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

The placement plan must include:

1. Crack treatment schedule including coefficient of friction testing
2. Methods and materials including:
 - 2.1. Description of equipment for applying HMWM
 - 2.2. Description of equipment for applying sand
 - 2.3. Gel time range and final cure time for resin

Revise rejected plans and resubmit. With each plan rejection, the Engineer gives revision directions including detailed comments in writing. The Engineer notifies you of a plan's acceptance or rejection within 2 weeks of receiving that plan.

41-3.01C(3) Reserved

41-3.01D Quality Control and Assurance

41-3.01D(1) General

Use test tiles to evaluate the HMWM cure time. Coat at least one 4 by 4 inch smooth glazed tile for each batch of HMWM. Place the coated tile adjacent to the area being treated. Do not apply sand to the test tiles.

Use the same type of crack treatment equipment for testing and production.

41-3.01D(2) Test Area

Before starting crack treatment, treat a test area of at least 500 square feet within the project limits at a location accepted by the Engineer. Use test areas outside the traveled way if available.

Treat the test area under weather and pavement conditions similar to those expected during crack treatment production.

The Engineer evaluates the test area based on the acceptance criteria. Do not begin crack treatment until the Engineer accepts the test area.

41-3.01D(3) Reserved

41-3.01D(4) Acceptance Criteria

The Engineer accepts a treated area if:

1. Corresponding test tiles are dry to the touch
2. Treated surface is tack-free and not oily
3. Sand cover adheres enough to resist hand brushing
4. Excess sand is removed
5. Coefficient of friction is at least 0.30 when tested under California Test 342

41-3.02 MATERIALS

HMWM consists of compatible resin, promoter, and initiator. HMWM resin may be prepromoted by mixing promoter and resin together before filling containers. Identify prepromoted resin on the container label.

Adjust the gel time to compensate for temperature changes throughout the application.

HMWM resin properties must have the following values:

Property	Test method	Value
Viscosity ^a (cP, max, Brookfield RVT with UL adapter, 50 RPM at 77 °F)	ASTM D2196	25
Specific gravity ^a (min, at 77 °F)	ASTM D1475	0.90
Flash point ^a (°F, min)	ASTM D3278	180
Vapor pressure ^a (mm Hg, max, at 77 °F)	ASTM D323	1.0
Tack-free time (minutes, max, at 77 °F)	Specimen prepared under California Test 551	400
Volatile content ^a (% , max)	ASTM D2369	30
PCC saturated surface-dry bond strength (psi, min, at 24 hours and 77 ± 2 °F)	California Test 551	500

^aPerform the test before adding initiator.

Sand must be commercial quality dry blast sand. At least 95 percent of the sand must pass the no. 8 sieve and at least 95 percent must be retained on the no. 20 sieve when tested under California Test 202.

41-3.02D Reserved

41-3.03 CONSTRUCTION

41-3.03A General

Before applying HMWM, clean the pavement surface by abrasive blasting and blow loose material from visible cracks with high-pressure air. Remove concrete curing seals from the pavement to be treated. The pavement must be dry when blast cleaning is performed. If the pavement surface becomes contaminated before applying the HMWM, clean the pavement surface by abrasive blasting.

If performing abrasive blasting within 10 feet of a lane occupied by traffic, operate abrasive blasting equipment with a concurrently operating vacuum attachment.

During pavement treatment, protect pavement joints, working cracks, and surfaces not being treated.

The equipment applying HMWM must combine the components by either static in-line mixers or by external intersecting spray fans. The pump pressure at the spray bars must not cause atomization. Do not use compressed air to produce the spray. Use a shroud to enclose the spray bar apparatus.

You may apply HMWM manually to prevent overspray onto adjacent traffic. If applying resin manually, limit the batch quantity of HMWM to 5 gallons.

Apply HMWM at a rate of 90 square feet per gallon. The prepared area must be dry and the surface temperature must be from 50 to 100 degrees F while applying HMWM. Do not apply HMWM if the ambient relative humidity is more than 90 percent.

Protect existing facilities from HMWM. Repair or replace existing facilities contaminated with HMWM at your expense.

Flood the treatment area with HMWM to penetrate the pavement and cracks. Apply HMWM within 5 minutes after complete mixing. Mixed HMWM viscosity must not increase. Redistribute excess material with squeegees or brooms within 10 minutes of application. Remove excess material from tined grooves.

Wait at least 20 minutes after applying HMWM before applying sand. Apply sand at a rate of approximately 2 pounds per square yard or until refusal. Remove excess sand by vacuuming or sweeping.

Do not allow traffic on the treated surface until:

1. Treated surface is tack-free and non-oily
2. Sand cover adheres enough to resist hand brushing
3. Excess sand is removed
4. Coefficient of friction is at least 0.30 determined under California Test 342

41-3.04 PAYMENT

Not Used

41-4 SPALL REPAIR

41-4.01 GENERAL

Section 41-4 includes specifications for repairing spalls in concrete pavement.

41-4.02 MATERIALS

Repair spalls using polyester concrete with a bonding agent. The bonding agent must comply with the requirements for HMWM in section 41-3.02 except tack-free time requirements do not apply and the HMWM must not contain wax.

Form board must be corrugated cardboard with a 6-mil polyethylene covering.

41-4.03 CONSTRUCTION

41-4.03A General

Prepare spall areas by removing concrete and cleaning. Use a form board to provide compression relief at joints and cracks.

After completing spall repairs do not allow traffic on the repairs for at least 2 hours after the time of final setting under ASTM C403/403M.

41-4.03B Remove Pavement

The Engineer determines the rectangular limits of unsound concrete pavement. Before removing pavement, mark the saw cut lines and spall repair area on the pavement surface.

Do not remove pavement until the Engineer verbally authorizes the saw cut area.

Use a power-driven saw with a diamond blade.

Remove pavement as shown and:

1. From the center of the repair area towards the saw cut
2. To the full saw cut depth
3. At least 2 inches beyond the saw cut edge to produce a rough angled surface

Produce a rough surface by chipping or other removal methods that do not damage the pavement remaining in-place. Completely remove any saw overcuts. Pneumatic hammers used for concrete removal must weigh 15 lbs or less.

If you damage concrete pavement outside the removal area, enlarge the area to remove the damaged pavement.

If dowel bars are exposed during removal, remove concrete from the exposed surface and cover with duct tape.

41-4.03C Cleaning

After pavement has been removed, clean the exposed faces of the concrete by:

1. Sand or water blasting. Water blasting equipment must be capable of producing a blast pressure of 3,000 to 6,000 psi.

2. Blowing the exposed concrete area with compressed air free of moisture and oil to remove debris after blasting. Air compressors must deliver air at a minimum of 120 cfm and develop 90 psi of nozzle pressure.

41-4.03D Form Board Installation

After cleaning, place the form board to match the existing joint or crack alignment. Extend the form board at least 3 inches beyond each end of the repair and at least 1 inch deeper than the repair. Remove the form board before sealing joints or cracks.

41-4.03E–41-4.03I Reserved

41-4.04 PAYMENT

Payment is calculated based on the authorized saw cut area.

The Department does not adjust the unit price for an increase or decrease in the spall repair quantity.

41-5 JOINT SEALS

41-5.01 GENERAL

41-5.01A Summary

Section 41-5 includes specifications for sealing concrete pavement joints or replacing existing concrete pavement joint seals. Pavement joints include isolation joints.

41-5.01B Definitions

Reserved

41-5.01C Submittals

At least 15 days before delivery to the job site, submit a certificate of compliance, MSDS, manufacturer's recommendations, and instructions for storage and installation of:

1. Liquid joint sealant.
2. Backer rods. Include the manufacturer data sheet verifying compatibility with the liquid joint sealant.
3. Preformed compression joint seal. Include the manufacturer data sheet used to verify the seal for the joint dimensions shown.
4. Lubricant adhesive.

Asphalt rubber joint sealant containers must comply with ASTM D6690. Upon delivery of asphalt rubber joint sealant to the job site, submit a certified test report for each lot based on testing performed within 12 months.

Submit a work plan for removing pavement and joint materials. Allow 10 days for authorization. Include descriptions of the equipment and methods for removal of existing pavement and joint material.

41-5.01D Quality Control and Assurance

41-5.01D(1) General

Before sealing joints, arrange for a representative from the manufacturer to provide training on cleaning and preparing the joint and installing the liquid joint sealant or preformed compression joint seal. Do not seal joints until your personnel and the Department's personnel have been trained.

The Engineer accepts joint seals based on constructed dimensions and visual inspection of completed seals for voids.

41-5.01D(2) Reserved

41-5.02 MATERIALS

41-5.02A General

Use the type of seal material described.

Silicone or asphalt rubber joint sealant must not bond or react with the backer rod.

41-5.02B Silicone Joint Sealant

Silicone joint sealant must be on the Authorized Material List.

41-5.02C Asphalt Rubber Joint Sealant

Asphalt rubber joint sealant must:

1. Be paving asphalt mixed with not less than 10 percent ground rubber by weight. Ground rubber must be vulcanized or a combination of vulcanized and devulcanized materials that pass a no. 8 sieve.
2. Comply with ASTM D6690 for Type II.
3. Be capable of melting at a temperature below 400 degrees F and applied to cracks and joints.

41-5.02D Backer Rods

Backer rods must:

1. Comply with ASTM D5249:
 - 1.1. Type 1 for asphalt rubber joint sealant
 - 1.2. Type 1 or Type 3 for silicone joint sealant
2. Be expanded, closed-cell polyethylene foam
3. Have a diameter at least 25 percent greater than the saw cut joint width

41-5.02E Preformed Compression Joint Seals

Preformed compression joint seals must:

1. Comply with ASTM D2628
2. Have 5 or 6 cells, except seals 1/2 inch wide or less may have 4 cells

Lubricant adhesive used to install seals must comply with ASTM D2835.

41-5.02F–41-5.02K Reserved

41-5.03 CONSTRUCTION

41-5.03A General

If joint sealing is described for new concrete pavement, do not start joint sealing activities until the pavement has been in place for at least 7 days. Seal new concrete pavement joints at least 7 days after concrete pavement placement if shown.

Remove existing pavement and joint material by sawing, rectangular plowing, cutting, or manual labor. Saw cut the reservoir before cleaning the joint. Use a power-driven saw with a diamond blade.

If you damage a portion of the pavement to remain in place, repair the pavement under section 41-4.

41-5.03B Joint Cleaning

41-5.03B(1) General

Clean the joint after removal and any repair is complete before installing joint seal material. Cleaning must be completed no more than 4 hours before installing backer rods, liquid joint seal, or preformed compression seals using the following sequence:

1. Removing debris
2. Drying
3. Sandblasting
4. Air blasting
5. Vacuuming

Clean in 1 direction to minimize contamination of surrounding areas.

41-5.03B(2) Removing Debris

Remove debris including dust, dirt, and visible traces of old sealant from the joint after sawing, plowing, cutting, or manual removal. Do not use chemical solvents to wash the joint.

41-5.03B(3) Drying

After removing debris, allow the reservoir surfaces to dry or remove moisture and dampness at the joint with compressed air that may be moderately hot.

41-5.03B(4) Sandblasting

After the joint is dry, sandblast the reservoir to remove remaining residue using a 1/4-inch diameter nozzle and 90 psi minimum pressure. Do not sandblast straight into the reservoir. Angle the sandblasting nozzle within 1 to 2 inches from the concrete and make at least 1 pass to clean each reservoir face.

41-5.03B(5) Air Blasting

After sandblasting, air blast the reservoir to remove sand, dirt, and dust 1 hour before sealing the joint. Use compressed air free of oil and moisture delivered at a minimum rate of 120 cfm and 90 psi nozzle pressure.

41-5.03B(6) Vacuuming

After air blasting, use a vacuum sweeper to remove debris and contaminants from the pavement surfaces surrounding the joint.

41-5.03B(7) Reserved

41-5.03C Installing Liquid Joint Sealant

Where backer rods are shown, place the rods before installing liquid joint sealant. Place backer rods under the manufacturer's instructions unless otherwise specified. The pavement and reservoir surfaces must be dry and the ambient air temperature must be at least 40 degrees F and above the dew point. The reservoir surface must be free of residue or film. Do not puncture the backer rod.

Immediately after placing the backer rod, install liquid joint sealant under the manufacturer's instructions unless otherwise specified. Before installing, demonstrate that fresh liquid sealant is ejected from the nozzle free of cooled or cured material. For asphalt rubber joint sealant, the pavement surface temperature must be at least 50 degrees F before installing.

Pump liquid joint sealant through a nozzle sized for the width of the reservoir so that liquid joint sealant is placed directly onto the backer rod. The installer must draw the nozzle toward his body and extrude liquid joint sealant evenly. Liquid joint sealant must maintain continuous contact with the reservoir walls during extrusion.

After placing liquid joint sealant, recess it to the depth shown within 10 minutes of installation and before a skin begins to form.

After each joint is sealed, remove excess liquid joint sealant on the pavement surface. Do not allow traffic over the sealed joints until the liquid joint sealant is set, tack free, and firm enough to prevent embedment of roadway debris.

41-5.03D Installing Preformed Compression Joint Seals

Install preformed compression joint seals using lubricant adhesive as shown and under the manufacturer's instructions.

Install longitudinal seals before transverse seals. Longitudinal seals must be continuous except splicing is allowed at intersections with transverse seals. Transverse seals must be continuous for the entire transverse length of concrete pavement except splices are allowed for widening and staged construction. With a sharp instrument, cut across the longitudinal seal at the intersection with transverse construction joints. If the longitudinal seal does not relax enough to properly install the transverse seal, trim the longitudinal seal to form a tight seal between the 2 joints.

If splicing is authorized, comply with the manufacturer's instructions.

Use a machine specifically designed for preformed compression joint seal installation. The machine must install the seal:

1. To the specified depth
2. To make continuous contact with the joint walls
3. Without cutting, nicking, or twisting the seal
4. Without stretching the seal more than 4 percent

Cut preformed compression joint seal material to the exact length of the pavement joint to be sealed. The Engineer measures this length. After you install the preformed compression joint seal, the Engineer

measures the excess length of material at the joint end. The Engineer divides the excess length by the measured cut length to determine the stretch percentage.

Seals must be compressed from 30 to 50 percent of the joint width when complete in place.

41-5.03E Reserved

41-5.04 PAYMENT

Not Used

41-6 CRACK AND SEAT

41-6.01 GENERAL

41-6.01A Summary

Section 41-6 includes specifications for cracking, seating, and preparing the surface of existing concrete pavement.

41-6.01B Definitions

Reserved

41-6.01C Submittals

Submit each core in a plastic bag or tube for acceptance at the time of sampling. Mark each core with a location description.

41-6.01D Quality Control and Assurance

41-6.01D(1) General

If cracking is noncompliant:

1. Stop crack and seat work
2. Modify your equipment and procedures and crack the noncompliant pavement again
3. Construct another test section
4. Take additional core samples to verify compliance
5. Construct an inspection strip if the concrete pavement has HMA on the surface

41-6.01D(2) Test Section

The Engineer determines and marks a test section up to 1000 square feet within the crack and seat area shown. Construct the test section and obtain the Engineer's verbal authorization before starting crack and seat work.

Immediately before cracking the test section, apply water to the pavement surface so that cracking can be readily evaluated. Crack the test section and vary impact energy and striking patterns to verify your procedure.

41-6.01D(3) Coring

Drill cores at least 6 inches in diameter under ASTM C42 to verify cracking in the Engineer's presence. Take at least 2 cores per test section and 1 core per lane mile for each pavement cracking machine used. The Engineer determines the core locations.

41-6.01D(4) Reserved

41-6.02 MATERIALS

41-6.02A General

Use fast-setting or polyester concrete to fill core holes.

41-6.03 CONSTRUCTION

41-6.03A Cracking

Crack existing concrete pavement using the procedures and equipment from the authorized test section.

Do not allow flying debris during cracking operations.

Crack existing concrete pavement into segments that nominally measure 6 feet transversely by 4 feet longitudinally. If the existing pavement is already cracked into segments, crack it into equal-sized square

or rectangular pieces that nominally measure not more than 6 feet transversely and from 3 to 5 feet longitudinally. Do not impact the pavement within 1 foot of another break line, pavement joint, or edge of pavement.

Cracks must be vertical, continuous, and penetrate the full depth of pavement. Cracks must be within 6 inches of vertical along the full depth of pavement. Do not cause surface spalling over 0.10-foot deep or excessive shattering of the pavement or base.

Cracking equipment must impact the pavement with a variable force in a controlled location. Do not use unguided free-falling weights such as "headache balls."

If the concrete pavement has no more than 0.10 foot of asphalt concrete on the surface, you may crack the pavement without removing the asphalt concrete. After cracking, construct an inspection strip by removing at least 500 square feet of asphalt concrete at a location determined by the Engineer. Construct additional inspection strips to demonstrate compliance where ordered by the Engineer.

After cracking, allow public traffic on the cracked or initial pavement layer for no more than 15 days.

41-6.03B Seating

Seat cracked concrete by making at least 5 passes over the cracked concrete with either:

1. Oscillating pneumatic-tired roller under section 39-3.03 and at least 15 tons
2. Vibratory pad-foot roller exerting a dynamic centrifugal force of at least 10 tons

A pass is 1 movement of a roller in either direction at 5 mph or less.

After all segments have been seated, clean loose debris from joints and cracks using compressed air free of moisture and oil.

Reseat any segment of cracked pavement that has not been overlaid within 24 hours of seating.

41-6.03C Surface Preparation

Before opening cracked and seated pavement to traffic or overlaying:

1. Fill joints, cracks, and spalls wider than 3/4 inch and deeper than 1 inch by applying tack coat and placing HMA under section 39-1.15, except use the no. 4 gradation instead of 3/8-inch.
2. Remove all loose debris and sweep the pavement.

41-6.03D Reserved

41-6.04 PAYMENT

Crack and seat existing concrete pavement is measured from the area of pavement cracked and seated. No deduction is made for existing cracked segments. The Department does not pay for HMA used to fill joints, cracks, and spalls.

41-7 TRANSITION TAPER

41-7.01 GENERAL

Section 41-7 includes specifications for constructing transition tapers in existing pavement.

41-7.02 MATERIALS

Not Used

41-7.03 CONSTRUCTION

Construct transition tapers by either grinding or removing and replacing the existing concrete. Do not allow flying debris during the construction of tapers.

Grinding must comply with section 42.

Replacement concrete must comply with section 41-9 except place concrete to the taper level shown and finish the surface with a coarse broom.

If the transition taper will be overlaid with HMA that is not placed before opening to traffic and there is a grade difference of more than 0.04 foot, construct a temporary taper by placing HMA that complies with section 39-1.15. Remove the temporary HMA taper before constructing the transition taper.

41-7.04 PAYMENT

Pavement transition tapers are measured using the dimensions shown. The Department does not pay for temporary HMA tapers.

41-8 DOWEL BAR RETROFIT

Reserved

41-9 INDIVIDUAL SLAB REPLACEMENT WITH RAPID STRENGTH CONCRETE

41-9.01 GENERAL

41-9.01A Summary

Section 41-9 includes specifications for removing existing concrete pavement and constructing individual slab replacement with rapid strength concrete (ISR—RSC).

41-9.01B Definitions

concrete raveling: Disintegration of the concrete surface layer from aggregate loss.

early age: Any age less than 10 times the time of final setting for concrete determined under ASTM C403/C403M.

full-depth crack: Crack that runs from one edge of the concrete slab to the opposite or adjacent side of the slab.

opening age: Age when the minimum modulus of rupture specified for opening to traffic and equipment is attained.

time of final setting: Elapsed time required to develop a concrete penetration resistance that is at least 4,000 psi under ASTM C403/C403M.

41-9.01C Submittals

41-9.01C(1) General

At least 15 days before delivery to the job site, submit manufacturer's recommendations, MSDS and instructions for storage and installation of joint filler material.

At least 45 days before starting ISR—RSC work submit a sample of cement from each proposed lot and samples of proposed admixtures in the quantities ordered by the Engineer.

During ISR—RSC placement operations, submit uniformity reports for hydraulic cement at least once every 30 days to the Engineer and METS, attention Cement Laboratory. Uniformity reports must comply with ASTM C917 except testing age and water content may be modified to suit the particular material.

Except for modulus of rupture tests, submit QC test result forms within 48 hours of the paving shift. Submit modulus of rupture results within:

1. 15 minutes of opening age test completion
2. 24 hours of 3-day test completion

41-9.01C(2) Quality Control Plan

If the quantity of ISR—RSC is at least 300 cu yd, submit a QC plan at least 20 days before placing trial slabs. If the quantity of ISR—RSC is less than 300 cu yd, submit proposed forms for RSC inspection, sampling, and testing.

41-9.01C(3) Mix Design

At least 10 days before use in a trial slab, submit a mix design. The maximum ambient temperature range for a mix design is 18 degrees F. Submit more than 1 mix design based on ambient temperature variations anticipated during RSC placement. Each mix design must include:

1. Mix design identification number

2. Aggregate source
3. Opening age
4. Aggregate gradation
5. Types of cement and chemical admixtures
6. Mix proportions
7. Maximum time allowed between batching and placing
8. Range of effective ambient temperatures
9. Time of final setting
10. Modulus of rupture development data from laboratory-prepared samples, including tests at:
 - 10.1. 1 hour before opening age
 - 10.2. Opening age
 - 10.3. 1 hour after opening age
 - 10.4. 1 day
 - 10.5. 3 days
 - 10.6. 7 days
 - 10.7. 28 days
11. Shrinkage test data
12. Any special instructions or conditions such as water temperature requirements

41-9.01C(4) Reserved

41-9.01D Quality Control and Assurance

41-9.01D(1) General

Designate a QC manager and assistant QC managers to administer the QC plan. The QC managers must hold current American Concrete Institute (ACI) certification as a Concrete Field Testing Technician-Grade I and a Concrete Laboratory Testing Technician-Grade II, except the assistant QC managers may hold Concrete Laboratory Testing Technician-Grade I instead of Grade II.

The QC manager responsible for the production period involved must review and sign the sampling, inspection, and test reports before submitting them. The QC manager must be present for:

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

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

Testing laboratories and equipment must comply with the Department's Independent Assurance Program. At the time of the QC plan submittal, the Department evaluates the quality control samplers and testers.

41-9.01D(2) Just-in-time Training

Reserved

41-9.01D(3) Quality Control Plan

Establish, implement, and maintain a QC plan for pavement. 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:

1. Names, qualifications, and certifications of QC personnel, including:
 - 1.1. QC manager
 - 1.2. Assistant QC managers
 - 1.3. Samplers and testers
2. Outline of procedure for the production, transportation, placement, and finishing of RSC

3. Outline of procedure and forms for concrete QC, sampling, and testing to be performed during and after RSC construction, including testing frequencies for modulus of rupture
4. Contingency plan for identifying and correcting problems in production, transportation, placement, or finishing RSC including:
 - 4.1. Action limits
 - 4.2. Suspension limits that do not exceed specified material requirements
 - 4.3. Detailed corrective action if limits are exceeded
 - 4.4. Temporary pavement structure provisions, including:
 - 4.4.1. The quantity and location of standby material
 - 4.4.2. Determination of need
5. Location of your quality control testing laboratory and testing equipment during and after paving operations
6. List of the testing equipment to be used, including the date of last calibration
7. Production target values for material properties that impact concrete quality or strength including cleanness value and sand equivalent
8. Outline procedure for placing and testing trial slabs, including:
 - 8.1. Locations and times
 - 8.2. Production procedures
 - 8.3. Placing and finishing methods
 - 8.4. Sampling methods, sample curing, and sample transportation
 - 8.5. Testing and test result reporting
9. Name of source plant with approved Material Plant Quality Program (MPQP)
10. Procedures or methods for controlling pavement quality including:
 - 10.1. Materials quality
 - 10.2. Contraction and construction joints
 - 10.3. Protecting pavement before opening to traffic

41-9.01D(4) Prepaving Conference

Schedule a prepaving conference and provide a facility to meet with the Engineer.

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

1. Project superintendent
2. Project manager
3. QC manager
4. Workers and your subcontractor's workers, including:
 - 4.1. Foremen
 - 4.2. Concrete plant manager
 - 4.3. Concrete plant operator
 - 4.4. Concrete plant inspectors
 - 4.5. Personnel performing saw cutting and joint sealing
 - 4.6. Paving machine operators
 - 4.7. Inspectors
 - 4.8. Samplers
 - 4.9. Testers

The purpose of the prepaving conference is to familiarize personnel with the project's specifications. Discuss the QC plan and processes for constructing each item of work, including:

1. Production
2. Transportation
3. Trial slabs
4. Pavement structure removal
5. Placement
6. Contingency plan
7. Sampling
8. Testing
9. Acceptance

Do not start trial slabs or paving activities until the listed personnel have attended the prepaving conference.

41-9.01D(5) Trial Slabs

Before starting individual slab replacement work, complete 1 trial slab for each mix design.

Place trial slabs near the job site at a mutually-agreed location that is neither on the roadway nor within the project limits. Trial slabs must be 10 by 20 feet and at least 10 inches thick.

During trial slab construction, sample and split the aggregate for grading, cleanness value, and sand equivalent testing.

Fabricate and test beams under California Test 524 to determine the modulus of rupture values.

Cure beams fabricated for early age testing such that the monitored temperatures in the beams and the slab are always within 5 degrees F of each other.

Monitor and record the internal temperatures of trial slabs and early age beams at intervals of at least 5 minutes. Install thermocouples or thermistors connected to strip-chart recorders or digital data loggers to monitor the temperatures. Temperature recording devices must be accurate to within 2 degrees F. Measure internal temperatures at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge until early age testing is completed.

Cure beams fabricated for 3-day testing under California Test 524 except place them into sand at a time that is from 5 to 10 times the time of final setting measured under ASTM C403/403M or 24 hours, whichever is earlier.

Trial slabs must have an opening age modulus of rupture of not less than 400 psi and a 3-day modulus of rupture of not less than 600 psi.

After authorization, remove and dispose of trial slabs and testing materials.

41-9.01D(6) Quality Control Testing

41-9.01D(6)(a) General

Provide continuous process control and quality control sampling and testing throughout RSC production and placement. Notify the Engineer at least 2 business days notice before any sampling and testing. Establish a testing facility at the job site or at an authorized location.

Sample under California Test 125.

During ISR—RSC placement, sample and fabricate beams for modulus of rupture testing within the first 30 cubic yards, at least once every 130 cu yd, and within the final truckload. Submit split samples and fabricate test beams for the Department's testing unless the Engineer informs you otherwise.

Determine the modulus of rupture at opening age under California Test 524, except beam specimens may be fabricated using an internal vibrator under ASTM C 31. Cure beams under the same conditions as the pavement until 1 hour before testing. Test 3 beam specimens in the presence of the Engineer and average the results. A single test represents no more than that day's production or 130 cu yd, whichever is less.

Determine the modulus of rupture at other ages using beams cured and tested under California Test 524 except place them in sand from 5 to 10 times the time of final setting under ASTM C403/C403M or 24 hours, whichever is earlier.

41-9.01D(6)(b) Rapid Strength Concrete

Your quality control must include testing RSC for the properties at the frequencies shown in the following table:

RSC Minimum Quality Control

Property	Test method	Minimum testing frequency ^a
Cleanness value	California Test 227	650 cu yd or 1 per shift
Sand equivalent	California Test 217	650 cu yd or 1 per shift
Aggregate gradation	California Test 202	650 cu yd or 1 per shift
Air content	California Test 504	130 cu yd or 2 per shift
Yield	California Test 518	2 per shift
Slump or penetration	ASTM C143 or California Test 533	1 per 2 hours of paving
Unit weight	California Test 518	650 cubic yards or 2 per shift
Aggregate Moisture Meter Calibration ^b	California Test 223 or California Test 226	1 per shift
Modulus of rupture	California Test 524	Comply with section 41-9.01D(6)(a)

^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

Maintain control charts to identify potential problems and causes. Post a copy of each control chart at a location determined by the Engineer.

Individual measurement control charts must use the target values in the mix proportions as indicators of central tendency.

Develop linear control charts for:

1. Cleanness value
2. Sand equivalent
3. Fine and coarse aggregate gradation
4. Air content
5. Penetration

Control charts must include:

1. Contract number
2. Mix proportions
3. Test number
4. Each test parameter
5. Action and suspension limits
6. Specification limits
7. Quality control test results

For fine and coarse aggregate gradation control charts, record the running average of the previous 4 consecutive gradation tests for each sieve and superimpose the specification limits.

For air content control charts, the action limit is ± 1.0 percent and the suspension limit is ± 1.5 percent of the specified values. If no value is specified, apply the air content value used in the approved mix design.

As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
 - 2.1. One point falls outside the suspension limit line
 - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent RSC.

Before each day's concrete pavement placement and at intervals not to exceed 4 hours of production, use a tachometer to test and record vibration frequency for concrete consolidation vibrators.

41-9.01D(6)(c) Reserved

41-9.01D(7) Acceptance Criteria

41-9.01D(7)(a) General

The final texture of ISR—RSC must pass visual inspection and have a coefficient of friction of at least 0.30 determined under California Test 342.

Allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is scheduled to be opened to traffic.

41-9.01D(7)(b) Modulus of Rupture

ISR—RSC is accepted based on your testing for modulus of rupture at opening age and the Department's testing for modulus of rupture at 3 days.

ISR—RSC must have a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is at least 600 psi.

Calculate the test result as the average from testing 3 beams for each sample. The test result represents 1 paving shift or 130 cu yd, whichever is less.

41-9.01D(7)(c) Concrete Pavement Smoothness

The Department tests for concrete pavement smoothness using a 12-foot straightedge. Straightedge smoothness specifications do not apply to the pavement surface placed within 12 inches of existing concrete pavement except parallel to the centerline at the midpoint of a transverse construction joint.

The concrete pavement surface must not vary from the lower edge of a 12-foot straightedge by more than:

1. 0.01 feet when parallel to the centerline
2. 0.02 feet when perpendicular to the centerline extending from edge to edge of a traffic lane

41-9.01D(7)(d) Cracking and Raveling

The Engineer rejects an ISR—RSC slab under section 6-3.06 if within 1 year of contract acceptance there is either:

1. Partial or full-depth cracking
2. Concrete raveling consisting of either:
 - 2.1. Combined raveled areas more than 5 percent of each ISR—RSC slab area
 - 2.2. Any single raveled area of more than 4 sq ft

41-9.01D(8) Reserved

41-9.02 MATERIALS

41-9.02A General

Reserved

41-9.02B Rapid Strength Concrete

RSC for ISR—RSC must comply with section 90-3.

Use either the 1-1/2 inch maximum or the 1-inch maximum combined grading specified in section 90-1.02C(4)(d).

Air content must comply with the minimum requirements in section 40-1.02B(4).

41-9.02C Base Bond Breaker

Use base bond breaker no. 3, 4, or 5 under section 36-2.

41-9.02D Reserved

41-9.03 CONSTRUCTION

41-9.03A General

Complete ISR—RSC adjacent to new pavement or existing pavement shown for construction as a 1st order of work. Replace individual slabs damaged during construction before placing final pavement delineation.

41-9.03B Removing Existing Pavement

Remove pavement under section 15-2.02. The Engineer determines the exact ISR—RSC limits after overlying layers are removed.

After removing pavement to the depth shown, grade to a uniform plane. Water as needed and compact the material remaining in place to a firm and stable base. The finished surface of the remaining material must not extend above the grade established by the Engineer.

41-9.03C Drill and Bond Dowel Bars

Drill existing concrete and bond dowel bars under section 41-10 if described. Do not install dowel bars in contraction joints.

41-9.03D Base Bond Breaker

Place base bond breaker before placing ISR—RSC. Comply with section 36-2.

41-9.03E Placing Rapid Strength Concrete

Do not place RSC if the ambient air temperature is forecast by the National Weather Service to be less than 40 degrees F within 72 hours of final finishing.

Before placing RSC against existing concrete, place 1/4-inch thick commercial quality polyethylene flexible foam expansion joint filler across the original transverse and longitudinal joint faces and extend the full depth of pavement to the top of the base layer. Place the top of the joint filler flush with the top of the pavement. Secure joint filler to the joint face of the existing pavement to prevent the joint filler from moving during the placement of RSC.

Use metal or wood side forms. Wood side forms must not be less than 1-1/2 inches thick. Side forms and connections must be of sufficient rigidity that movement will not occur under forces from equipment or RSC. Clean and oil side forms before each use. Side forms must remain in place until the pavement edge no longer requires the protection of forms.

After you place RSC, consolidate it using high-frequency internal vibrators adjacent to forms and across the full paving width. Place RSC as nearly as possible to its final position. Do not use vibrators for extensive shifting of concrete pavement.

Spread and shape RSC with powered finishing machines supplemented by hand finishing. After you mix and place RSC, do not add water to the surface to facilitate finishing. You may request authorization to use surface finishing additives. Submit the manufacturer's instructions with your request.

Place consecutive concrete loads without interruption. Do not allow cold joints where a visible lineation forms after concrete is placed, sets, and hardens before additional concrete placed.

Where the existing transverse joint spacing in an adjacent lane exceeds 15 feet, construct an additional transverse contraction joint midway between the existing joints. Complete sawing of contraction joints within 2 hours of completion of final finishing.

Cut contraction joints a minimum of 1/3 the slab depth.

41-9.03F Final Finishing

After preliminary finishing, round the edges of the initial paving width to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius. Mark each ISR—RSC area with a stamp. The stamp mark must show the month, day, and year of placement and contract number. Level the location of the stamp with a steel trowel below the pavement texture. Orient the stamp mark so it can be read from the outside edge of ISR—RSC.

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

Tines must be from 3/32 to 1/8 inch wide on 3/4-inch centers and have enough length, thickness, and resilience to form grooves from 1/8 to 3/16 inch deep after the concrete has hardened. Grooves must extend over the entire pavement width except do not construct grooves 3 inches from longitudinal pavement edges or joints.

Final texture must be uniform and smooth. Grooves must be parallel and aligned to the pavement edge across the pavement width. The groove alignment must not vary more than 0.1 foot for every 12 foot length.

Protect RSC under section 90-1.03C.

41-9.03G Temporary Pavement Structure

Temporary pavement structure must be RSC or 3-1/2 inch thick HMA over aggregate base.

41-9.03H Noncompliant Individual Slab Replacement

Replace an ISR—RSC slab with any of the following:

1. One or more full-depth cracks.
2. Concrete raveling.
3. Noncompliant smoothness except you may request authorization for grinding under section 42 and retesting. Grinding that causes a depression will not be considered. Smoothness must be corrected within 48 hours of placing ISR—RSC.
4. Noncompliant modulus of rupture.

If the modulus of rupture at opening age is at least 400 psi and the modulus of rupture at 3 days is at least 500 psi but less than 600 psi, you may request authorization to leave the ISR—RSC in place and accept the specified deduction.

If pavement is noncompliant for coefficient of friction, groove or grind the pavement under section 42. Comply with section 40-1.03Q(4) and groove or grind before the installation of any required joint seal or edge drains adjacent to the areas to the noncompliant area.

If an ISR—RSC slab has partial depth cracking, treat it with high-molecular-weight methacrylate under section 41-3.

41-9.03I Replace Pavement Delineation

Replace traffic stripes, pavement markings, and markers that are removed, obliterated, or damaged by ISR—RSC under sections 84 and 85.

41-9.03J Reserved

41-9.04 PAYMENT

Replace base is not included in the payment for individual slab replacement (RSC).

Drill and bond dowel bars are not included in payment for individual slab replacement (RSC).

For individual slab replacement (RSC) with a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is greater than or equal to 500 psi but less than 550 psi, the Department deducts 10 percent of the payment for individual slab replacement (RSC).

For individual slab replacement (RSC) with a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is greater than or equal to 550 psi but less than 600 psi, the Department deducts 5 percent of the payment for individual slab replacement (RSC).

41-10 DRILL AND BOND BARS

41-10.01 GENERAL

41-10.01A Summary

Section 41-10 includes specifications for drilling, installing, and bonding tie bars and dowel bars in concrete pavement.

41-10.01B Definitions

Reserved

41-10.01C Submittals

Submit a certificate of compliance for:

1. Tie bars
2. Dowel bars
3. Dowel bar lubricant
4. Chemical adhesive
5. Epoxy powder coating

At least 15 days before delivery to the job site, submit the manufacturer's recommendations and instructions for storage, handling, and use of chemical adhesive.

41-10.01D Quality Control and Assurance

41-10.01D(1) General

Drill and bond bar is accepted based on inspection before concrete placement.

41-10.01D(2) Reserved

41-10.02 MATERIALS

41-10.02A General

Dowel bar lubricant must comply with section 40-1.02D.

Chemical adhesive for drilling and bonding bars must be on the Authorized Material List. The Authorized Material List indicates the appropriate chemical adhesive system for concrete temperature and installation conditions.

Each chemical adhesive system container must clearly and permanently show the following:

1. Manufacturer's name
2. Model number of the system
3. Manufacture date
4. Batch number
5. Expiration date
6. Current International Conference of Building Officials Evaluation Report number
7. Directions for use
8. Storage requirement
9. Warnings or precautions required by state and federal laws and regulations

41-10.02B Reserved

41-10.03 CONSTRUCTION

41-10.03A General

Drill holes for bars. Clean drilled holes in compliance with the chemical adhesive manufacturer's instructions. Holes must be dry at the time of placing the chemical adhesive and bars. Use a grout retention ring when drilling and bonding dowel bars. Immediately after inserting the bar into the chemical adhesive, support the bar to prevent movement until chemical adhesive has cured the minimum time recommended by the manufacturer.

Apply dowel bar lubricant to the entire exposed portion of the dowel bar.

If the Engineer rejects a bar installation: stop paving, drilling, and bonding activities. Adjust your procedures and obtain the Engineer's verbal authorization before resuming paving, drilling, and bonding.

Cut the rejected bar flush with the pavement joint surface and coat the exposed end of the bar with chemical adhesive. Offset the new hole 3 inches horizontally from the rejected hole's center.

41-10.03B Tie Bar Tolerance

Place tie bars within the tolerances shown in the following table:

Tie Bar Tolerances	
Dimension	Tolerance
Horizontal skew (vertical skew: bar length)	1:6
Vertical skew (vertical skew: bar length)	1:6
Longitudinal translation (inch)	±1
Horizontal offset (embedment, inch)	±1
Height relative to the adjacent bar	±1
Vertical Depth (clearance from the pavement surface or bottom, inches, min)	3

41-10.03C Dowel Bar Tolerance

Place dowel bars within the tolerances specified in section 40-1.01D(7)(b)(v).

41-10.03D Reserved

41-10.04 PAYMENT

Not Used

41-11-41-15 RESERVED

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

42 GROOVE AND GRIND CONCRETE

07-19-13

Replace the paragraph of section 42-1.01A with:

Section 42-1 includes general specifications for grooving and grinding concrete.

07-19-13

Replace the headings and paragraphs in section 42-3 with:

42-3.01 GENERAL

07-19-13

42-3.01A Summary

Section 42-3 includes specifications for grinding the surfaces of pavement, bridge decks, and approach slabs.

42-3.01B Definitions

Reserved

42-3.01C Submittals

Reserved

42-3.01D Quality Control and Assurance

Reserved

42-3.02 MATERIALS

Not Used

42-3.03 CONSTRUCTION

42-3.03A General

Grind surfaces in the longitudinal direction of the traveled way and grind the full lane width. Begin and end grinding at lines perpendicular to the roadway centerline.

Grinding must result in a parallel corduroy texture with grooves from 0.08 to 0.12 inch wide and from 55 to 60 grooves per foot of width. Grooves must be from 0.06 to 0.08 inch from the top of the ridge to the bottom of the groove.

Grind with abrasive grinding equipment using diamond cutting blades mounted on a self-propelled machine designed for grinding and texturing concrete pavements.

42-3.03B Pavement

Grind existing concrete pavement that is adjacent to an individual slab replacement. Grind the replaced individual slab and all the existing slabs immediately surrounding it. Grind after the individual slab is replaced.

Grind existing concrete pavement that is adjacent to new lanes of concrete pavement. Grind before paving.

After grinding, the existing pavement must comply with requirements for smoothness and coefficient of friction in section 40 except:

1. At the midpoint of a joint or crack, test smoothness with a straightedge. Both sides must have uniform texture.
2. Straightedge and inertial profiler requirements do not apply to areas abnormally depressed from subsidence or other localized causes. End smoothness testing 15 feet before and resume 15 feet after these areas.
3. Cross-slope must be uniform and have positive drainage across the traveled way and shoulder.

As an alternative to grinding existing concrete pavement, you may replace the existing pavement. The new concrete pavement must be the same thickness as the removed pavement. Replace existing pavement between longitudinal joints or pavement edges and transverse joints. Do not remove portions of slabs.

Replacement of existing concrete pavement must comply with requirements for individual slab replacement in section 41-9.

42-3.03C Bridge Decks, Approach Slabs, and Approach Pavement

Grind bridge decks, approach slabs, and approach pavement only if described.

The following ground areas must comply with the specifications for smoothness and concrete cover over reinforcing steel in section 51-1.01D(4):

1. Bridge decks
2. Approach slabs
3. Adjacent 50 feet of approach pavement

After grinding, the coefficient of friction must comply with section 51-1.01D(4).

42-3.04 PAYMENT

Grinding existing approach slabs and adjacent 50 feet of approach pavement is paid for as grind existing bridge deck.

The Department does not pay for grinding replacement concrete pavement or for additional grinding to comply with smoothness requirements.

section 90, except they must not contain chloride ions in excess of 0.25 percent by weight. Do not exceed 5 gallons of water per 94 lb of cement.

Mix the grout as follows:

1. Add water to the mixer followed by cement and any admixtures or fine aggregate.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout.
3. Agitate the grout continuously until the grout is pumped.
4. Do not add water after the initial mixing.

Add to section 46-1.03B:

Dispose of drill cuttings under section 19-2.03B.

04-20-12

Add to the end of section 46-1.03C:

Grouting equipment must be:

07-19-13

1. Capable of grouting at a pressure of at least 100 psi
2. Equipped with a pressure gage having a full-scale reading of not more than 300 psi

07-19-13

Delete the 3rd paragraph of section 46-2.01A.

Add to the beginning of section 46-2.01C:

Submittals for strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50-1.01C.

07-19-13

Add to section 46-2.01D:

07-19-13

46-2.01D(3) Steel

Strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50-1.01D.

46-2.01D(4) Grout

The Department tests the efflux time of the grout under California Test 541.

Add to the beginning of section 46-2.02B:

07-19-13

Strand tendons, bar tendons, and bar couplers must comply with section 50-1.02B.

Replace the 1st paragraph of section 46-2.02E with:

07-19-13

The efflux time of the grout immediately after mixing must be at least 11 seconds.

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

Steel wire must comply with ASTM A 82/A 82M. Welded wire reinforcement must comply with ASTM A 185/A 185M.

02-17-12

Replace section 47-3 with:

47-3 REINFORCED CONCRETE CRIB WALLS

07-19-13

47-3.01 General

Section 47-3 includes specifications for constructing reinforced concrete crib walls.

Reinforced concrete crib walls must comply with section 51.

Reinforcement must comply with section 52.

Concrete crib walls consist of a series of rectangular cells composed of interlocking, precast, reinforced concrete headers, stretchers, and blocks.

47-3.02 Materials

47-3.02A General

Pads shown to be placed between bearing surfaces must either be (1) neoprene complying with the specifications for strip waterstops in section 51-2.05 or (2) commercial quality no. 30 asphalt felt. The protective board is not required for neoprene pads.

47-3.02B Crib Members

47-3.02B(1) General

All members may be manufactured to dimensions 1/8 inch greater in thickness than shown. The thickness of the lowest step must not be less than the dimension shown.

Stretchers may be manufactured 1/2 inch less in length than shown.

When an opening is shown in the face of the wall, special length stretchers and additional headers may be necessary.

For non-tangent wall alignments, special length stretchers may be required.

For non-tangent wall alignments and at locations where filler blocks are required, special length front face closure members may be required.

47-3.02B(2) Reinforcement

Reinforcing wire must comply with ASTM A 496/A 496M.

For hoops or stirrups use either (1) reinforcing wire or (2) deformed steel welded wire reinforcement. The size must be equivalent to the reinforcing steel shown. Deformed steel welded wire reinforcement must comply with ASTM A 497/A 497M.

47-3.02B(3) Concrete

Concrete test cylinders must comply with section 90-1.01D(5), except when the penetration of fresh concrete is less than 1 inch, the concrete in the test mold must be consolidated by vibrating the mold equivalent to the consolidating effort being used to consolidate the concrete in the members.

Cure crib members under section 51-4.02C.

When removed from forms, the members must present a true surface of even texture, free from honeycombs and voids larger than 1 inch in diameter and 5/16 inch in depth. Clean and fill other pockets with mortar under sections 51-1.02F and 51-1.03E(2).

External vibration resulting in adequate consolidation may be used.

Delete "field" in the 1st sentence of the 5th paragraph of section 48-2.01C(1).

04-19-13

Replace item 1 in the list in the 6th paragraph of section 48-2.01C(1) with:

1. Itemize the testing, inspection methods, and acceptance criteria used

04-19-13

Replace "sets" at each occurrence in the 4th paragraph of section 48-2.01C(2) with:

copies

07-19-13

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

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

09-16-11

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

Add to section 48-2.01C(2):

Shop drawings and calculations for falsework removal systems employing methods of holding falsework from above by winches, hydraulic jacks with prestressing steel, HS rods, or cranes must include:

07-19-13

1. Design code used for the analysis of the structural members of the independent support system
2. Provisions for complying with current Cal/OSHA requirements
3. Load tests and ratings within 1 year of intended use of hydraulic jacks and winches
4. Location of the winches, hydraulic jacks with prestressing steel, HS rods, or cranes
5. Analysis showing that the bridge deck and overhang are capable of supporting all loads at all time
6. Analysis showing that winches will not overturn or slide during all stages of loading
7. Location of deck and soffit openings if needed
8. Details of repair for the deck and soffit openings after falsework removal

Replace the 1st paragraph of section 48-2.01D(2) with:

Welding must comply with AWS D1.1 or other recognized welding standard, except for fillet welds where the load demands are 1,000 lb or less per inch for each 1/8 inch of fillet weld.

04-19-13

Replace the 1st through 3rd sentences in the 2nd paragraph of section 48-2.01D(2) with:

Perform NDT on welded splices using UT or RT. Each weld and any repair made to a previously welded splice must be tested.

04-19-13

Replace the 3rd paragraph of section 48-2.01D(2) with:

For previously welded splices, perform and document all necessary testing and inspection required to certify the ability of the falsework members to sustain the design stresses.

04-19-13

Replace the paragraph of section 49-2.01A(1) with:

Section 49-2.01 includes general specifications for fabricating and installing driven piles.
Epoxy-coated bar reinforcing steel used for pile anchors must comply with section 52-2.02.

07-19-13

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

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

01-20-12

Replace the paragraph of section 49-2.02A(1) with:

Section 49-2.02 includes specifications for fabricating and installing steel pipe piles.

07-19-13

Replace the definitions in section 49-2.02A(2) with:

shop welding: Welding performed at a plant on the Department's Authorized Facility Audit List.
field welding: Welding not performed at a plant on the Department's Authorized Facility Audit List.

07-19-13

Replace item 2 in the list in the paragraph of section 49-2.02A(3)(b) with:

2. Certified mill test reports for each heat number of steel used in pipe piles being furnished.

07-19-13

Replace the paragraph of section 49-2.02A(4)(a) with:

Section 11-3.02 does not apply to shop welds in steel pipe piles fabricated at a facility on the Department's Authorized Facility Audit List.

For groove welds using submerged arc welding from both sides without backgouging, qualify the WPS under Table 4.5 of AWS D1.1.

07-19-13

Replace "0.45" in the 2nd paragraph of section 49-2.02B(1)(a) with:

0.47

07-19-13

Replace the 1st paragraph of section 49-2.02B(1)(b) with:

Welds must comply with AWS D1.1. Circumferential welds must be CJP welds.

07-19-13

Delete the 5th paragraph of section 49-2.02B(1)(b).

07-19-13

Add to section 49-2.02B(1):

49-2.02B(1)(d) Reserved

07-19-13

Replace "4.8.4" in item 2.3 in the list in the 2nd paragraph of section 49-2.02B(2) with:

4.9.4

07-19-13

Delete the 3rd paragraph of section 49-2.02C(2).

07-19-13

Replace the paragraph of section 49-2.03A(1) with:

Section 49-2.03 includes specifications for fabricating and installing structural shape steel piles.

07-19-13

Replace the paragraph of section 49-2.03A(3) with:

Submit a certified material test report and a certificate of compliance that includes a statement that all materials and workmanship incorporated in the work and all required tests and inspections of this work have been performed as described.

07-19-13

Replace the 1st paragraph of section 49-2.03B with:

Structural shape steel piles must comply with ASTM A 36/A 36M, ASTM A 572/A 572M, ASTM A 709/A 709M, or ASTM A 992/A 992M.

07-19-13

Replace "sets" in the 1st paragraph of section 49-2.04A(3) with:

copies

04-19-13

Delete the 1st paragraph of section 49-2.04A(4).

07-19-13

Replace the 3rd and 4th paragraphs of section 49-2.04B(2) with:

Piles in a corrosive environment must be steam or water cured under section 90-4.03.

10-19-12

If piles in a corrosive environment are steam cured, either:

1. Keep the piles continuously wet for at least 3 days. The 3 days includes the holding and steam curing periods.
2. Apply curing compound under section 90-1.03B(3) after steam curing.

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

Section 49-3.01 includes general specifications for constructing CIP concrete piles.

07-19-13

Add to section 49-3.01A:

Concrete must comply with section 51.

01-20-12

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

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

01-20-12

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

dry hole:

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

01-20-12

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

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

01-20-12

Replace item 5 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

5. Methods and equipment for determining:
 - 5.1. Depth of concrete
 - 5.2. Theoretical volume of concrete to be placed, including the effects on volume if casings are withdrawn
 - 5.3. Actual volume of concrete placed

10-19-12

Add to the list in the 1st paragraph of section 49-3.02A(3)(b):

8. Drilling sequence and concrete placement plan.

01-18-13

Replace item 2 in the list in the 1st paragraph of section 49-3.02A(3)(g) with:

2. Be sealed and signed by an engineer who is registered as a civil engineer in the State. This requirement is waived for either of the following conditions:
 - 2.1. The proposed mitigation will be performed under the current Department-published version of *ADSC Standard Mitigation Plan 'A' - Basic Repair* without exception or modification.
 - 2.2. The Engineer determines that the rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, and you elect to repair the pile using the current

01-20-12

Department-published version of *ADSC Standard Mitigation Plan 'B' - Grouting Repair* without exception or modification.

Replace "49-2.03A(4)(d)" in the 1st paragraph of section 49-3.02A(4)(d)(i) with:

49-3.02A(4)(d)

07-19-13

Add to the beginning of section 49-3.02A(4)(d)(ii):

If the drilled hole is dry or dewatered without the use of temporary casing to control ground water, installation of inspection pipes is not required.

07-19-13

Replace item 1 in the list in the 1st paragraph of section 49-3.02A(4)(d)(ii) with:

1. Inspection pipes must be schedule 40 PVC pipe complying with ASTM D 1785 with a nominal pipe size of 2 inches. Watertight PVC couplers complying with ASTM D 2466 are allowed to facilitate pipe lengths in excess of those commercially available. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.

01-20-12

Add to section 49-3.02A(4)(d)(iv):

If the Engineer determines it is not feasible to use one of ADSC's standard mitigation plans to mitigate the pile, schedule a meeting and meet with the Engineer before submitting a nonstandard mitigation plan.

01-20-12

The meeting attendees must include your representatives and the Engineer's representatives involved in the pile mitigation. The purpose of the meeting is to discuss the type of pile mitigation acceptable to the Department.

Provide the meeting facility. The Engineer conducts the meeting.

Replace the 1st paragraph of section 49-3.02B(5) with:

Grout must consist of cementitious material and water, and may contain an admixture if authorized. Do not exceed 5 gallons of water per 94 lb of cement.

07-19-13

Cementitious material must comply with section 90-1.02B, except SCMs are not required.

Water must comply with section 90-1.02D. If municipally supplied potable water is used, the testing specified in section 90-1.02D is waived.

Admixtures must comply with section 90, except admixtures must not contain chloride ions in excess of 0.25 percent by weight.

Use aggregate to extend the grout as follows:

1. Aggregate must consist of at least 70 percent fine aggregate and approximately 30 percent pea gravel, by weight.
2. Fine aggregate must comply with section 90-1.02C(3).
3. Size of pea gravel must be such that 100 percent passes the 1/2-inch sieve, at least 85 percent passes the 3/8-inch sieve, and not more than 5 percent passes the no. 8 sieve.
4. Minimum cementitious material content of the grout must not be less than 845 lb/cu yd of grout.

Mix the grout as follows:

1. Add water to the mixer followed by cementitious material, aggregates, and any admixtures.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout.
3. Agitate the grout continuously until the grout is pumped.
4. Do not add water after initial mixing.

Replace section 49-3.02B(8) with:

01-20-12

49-3.02B(8) Spacers

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

Plastic spacers must:

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

Add between the 1st and 2nd paragraphs of section 49-3.02C(2):

07-19-13

For CIDH concrete piles with a pile cap, the horizontal tolerance at the center of each pile at pile cut-off is the larger of 1/24 of the pile diameter or 3 inches. The horizontal tolerance for the center-to-center spacing of 2 adjacent piles is the larger of 1/24 of the pile diameter or 3 inches.

Add to section 49-3.02C(4):

01-20-12

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

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

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

07-19-13

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 than the column cage and the concrete is placed under dry conditions, maintain a clear horizontal distance of at least 3.5 inches between the two cages
3. If the pile reinforcing cage is larger than the column cage and the concrete is placed under slurry, maintain a clear horizontal distance of at least 5 inches between the two cages

Replace section 49-3.02C(6) with:

07-19-13

49-3.02C(6) Construction Joint

Section 49-3.02C(6) applies to CIDH concrete piles where a construction joint is shown.

If a permanent steel casing is not shown, you must furnish and install a permanent casing. The permanent casing must:

1. Be watertight and of sufficient strength to prevent damage and to withstand the loads from installation procedures, drilling and tooling equipment, lateral concrete pressures, and earth pressures.
2. Extend at least 5 feet below the construction joint. If placing casing into rock, the casing must extend at least 2 feet below the construction joint.
3. Not extend above the top of the drilled hole or final grade whichever is lower.
4. Not increase the diameter of the CIDH concrete pile more than 2 feet.
5. Be installed by impact or vibratory hammers, oscillators, rotators, or by placing in a drilled hole. Casings placed in a drilled hole must comply with section 49-3.02C(5).

Section 49-2.01A(4)(b) does not apply to permanent casings specified in this section.

Add to section 49-4.01:

Steel soldier piles must comply with section 49-2.03.

07-19-13

Replace the headings and paragraphs in section 49-4.02 with:

Concrete anchors must comply with the specifications for studs in clause 7 of AWS D1.1.

07-19-13

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50 PRESTRESSING CONCRETE

07-19-13

Replace "sets" at each occurrence in the 2nd and 3rd paragraphs of section 50-1.01C(3) with:

copies

04-19-13

Add to section 50-1.01C(3):

Include a grouting plan with your shop drawing submittal. The grouting plan must include:

07-19-13

1. Detailed grouting procedures
2. Type, quantity, and brand of materials to be used
3. Type of equipment to be used including provisions for backup equipment
4. Types and locations of grout inlets, outlets, and vents
5. Methods to clean ducts before grouting
6. Methods to control the rate of flow within ducts
7. Theoretical grout volume calculations for each duct
8. Duct repair procedures due to an air pressure test failure
9. Mixing and pumping procedures
10. Direction of grouting
11. Sequence of use of inlets and outlets
12. Procedure for handling blockages
13. Proposed forms for recording grouting information
14. Procedure for secondary grouting
15. Names of people who will perform grouting activities including their relevant experience and certifications

Add to section 50-1.01C:

07-19-13

50-1.01C(5) Grout

Submit a daily grouting report for each day grouting is performed. Submit the report within 3 days after grouting. The report must be signed by the technician supervising the grouting activity. The report must include:

1. Identification of each tendon
2. Date grouting occurred
3. Time the grouting started and ended
4. Date of placing the prestressing steel in the ducts
5. Date of stressing
6. Type of grout used
7. Injection end and applied grouting pressure
8. Actual and theoretical quantity of grout used to fill duct
9. Ratio of actual to theoretical grout quantity
10. Records of air, grout, and structure surface temperatures during grouting.
11. Summary of tests performed and results, except submit compressive strength and chloride ion test results within 48 hours of test completion
12. Names of personnel performing the grouting activity
13. Summary of problems encountered and corrective actions taken
14. Summary of void investigations and repairs made

Replace the introductory clause in the 1st paragraph of section 50-1.01C(4) with:

Submit test samples for the materials shown in the following table to be used in the work:

07-19-13

Add between "the" and "test samples" in the 1st paragraph of section 50-1.01D(2):

prestressing steel

07-19-13

Replace the 3rd paragraph of section 50-1.01D(2) with:

The Department may verify the prestressing force using the Department's load cells.

10-19-12

Replace the 3rd paragraph in section 50-1.01D(3) with:

Each pressure gage must be fully functional and have an accurately reading, clearly visible dial or display. The dial must be at least 6 inches in diameter and graduated in 100 psi increments or less.

07-19-13

Add between the 5th and 6th paragraphs of section 50-1.01D(3):

Each jack and its gages must be calibrated as a unit.

07-19-13

Replace the 6th paragraph in section 50-1.01D(3) with:

Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:

07-19-13

1. Schedule the calibration of the jacking equipment with METS
2. Mechanically calibrate the gages with a dead weight tester or other authorized means before calibration of the jacking equipment by METS
3. Verify that the jack and supporting systems are complete, with proper components, and are in good operating condition
4. Provide labor, equipment, and material to (1) install and support the jacking and calibration equipment and (2) remove the equipment after the calibration is complete
5. Plot the calibration results

Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 6 months of use and after each repair.

Add to section 50-1.01D:

07-19-13

50-1.01D(4) Pressure Testing Ducts

For post-tensioned concrete bridges, pressure test each duct with compressed air after stressing. To pressure test the ducts:

1. Seal all inlets, outlets, and grout caps.
2. Open all inlets and outlets on adjacent ducts.
3. Attach an air compressor to an inlet at 1 end of the duct. The attachment must include a valve that separates the duct from the air source.
4. Attach a pressure gage to the inlet at the end of the duct.
5. Pressurize the duct to 50 psi.
6. Lock-off the air source.
7. Record the pressure loss after 1 minute.
8. If there is a pressure loss exceeding 25 psi, repair the leaks with authorized methods and retest.

Compressed air used to clear and test the ducts must be clean, dry, and free of oil or contaminants.

50-1.01D(5) Duct Demonstration of Post-Tensioned Members

Before placing forms for deck slabs of box girder bridges, demonstrate that any prestressing steel placed in the ducts is free and unbonded. If no prestressing steel is in the ducts, demonstrate that the ducts are unobstructed.

If prestressing steel is installed after the concrete is placed, demonstrate that the ducts are free of water and debris immediately before installing the steel.

Before post-tensioning any member, demonstrate that the prestressing steel is free and unbonded in the duct.

The Engineer must witness all demonstrations.

50-1.01D(6) Void Investigation

In the presence of the Engineer, investigate the ducts for voids between 24 hours and 72 hours after grouting completion. As a minimum, inspect the inlet and outlet ports at the anchorages and at high points in the tendons for voids after removal. Completely fill any voids found with secondary grout.

50-1.01D(7) Personnel Qualifications

Perform post-tensioning field activities, including grouting, under the direct supervision of a technician certified as a level 2 Bonded PT Field Specialist through the Post-Tensioning Institute. Grouting activities may be performed under the direct supervision of a technician certified as a Grouting Technician through the American Segmental Bridge Institute.

Replace the 6th paragraph of section 50-1.02B with:

07-19-13

Package the prestressing steel in containers or shipping forms that protect the steel against physical damage and corrosion during shipping and storage.

Replace the 13th paragraph of section 50-1.02B with:

07-19-13

Prestressing steel is rejected if surface rust either:

1. Cannot be removed by hand-cleaning with a fine steel wool pad
2. Leaves pits visible to the unaided eye after cleaning

Replace the 4th paragraph of section 50-1.02C with:

07-19-13

Admixtures must comply with section 90, except admixtures must not contain chloride ions in excess of 0.25 percent by weight.

Delete the 5th paragraphs of section 50-1.02C.

07-19-13

Add to section 50-1.02C:

07-19-13

Secondary grout must:

1. Comply with ASTM C 1107
2. Not have a deleterious effect on the steel, concrete, or bond strength of the steel to concrete

Replace item 9 including items 9.1 and 9.2 in the list in the 1st paragraph of section 50-1.02D with:

07-19-13

9. Have an inside cross-sectional area of at least 2.5 times the net area of the prestressing steel for multistrand tendons

Replace "3/8" in item 10 in the list in the 1st paragraph of section 50-1.02D with:

07-19-13

1/2

Delete the 2nd sentences in the 1st paragraph of section 50-1.02E.

07-19-13

Replace section 50-1.02F with:

07-19-13

50-1.02F Permanent Grout Caps

Permanent grout caps for anchorage systems of post-tensioned tendons must:

1. Be glass-fiber-reinforced plastic with antioxidant additives. The environmental stress-cracking failure time must be at least 192 hours under ASTM D 1693, Condition C.

2. Completely cover and seal the wedge plate or anchorage head and all exposed metal parts of the anchorage against the bearing plate using neoprene O-ring seals.
3. Have a grout vent at the top of the cap.
4. Be bolted to the anchorage with stainless steel complying with ASTM F 593, alloy 316. All fasteners, including nuts and washers, must be alloy 316.
5. Be pressure rated at or above 150 psi.

Add to section 50-1.02:

09-16-11

50-1.02G Sheathing

Sheathing for debonding prestressing strand must:

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

Split sheathing must overlap at least 3/8 inch.

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

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

Replace the 2nd paragraph of section 50-1.03A(3) with:

07-19-13

After installation, cover the duct ends and vents to prevent water or debris from entering.

Add to section 50-1.03A(3):

07-19-13

Support ducts vertically and horizontally during concrete placement at a spacing of at most 4 feet.

Delete "at least" in the 1st paragraph of section 50-1.03B(1).

07-19-13

Add to section 50-1.03B(1):

01-20-12

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

Delete the 1st through 4th paragraphs of section 50-1.03B(2)(a).

07-19-13

Replace "temporary tensile strength" in the 7th paragraph of section 50-1.03B(2)(a) with:

07-19-13

temporary tensile stress

Add to section 50-1.03B(2)(a):

07-19-13

If prestressing strand is installed using the push-through method, use guide caps at the front end of each strand to protect the duct from damage.

Add to the list in the 2nd paragraph of section 50-1.03B(2)(c):

07-19-13

3. Be equipped with permanent grout caps

Replace section 50-1.03B(2)(d) with:

07-19-13

50-1.03B(2)(d) Bonding and Grouting

50-1.03B(2)(d)(i) General

Bond the post-tensioned prestressing steel to the concrete by completely filling the entire void space between the duct and the prestressing steel with grout.

Ducts, vents, and grout caps must be clean and free from water and deleterious materials that would impair bonding of the grout or interfere with grouting procedures. Compressed air used for cleaning must be clean, dry, and free of oil or contaminants.

Prevent the leakage of grout through the anchorage assembly by positive mechanical means.

Before starting daily grouting activities, drain the pump system to remove any water from the piping system.

Break down and thoroughly clean the pump and piping system after each grouting session.

After completing duct grouting activities:

1. Abrasive blast clean and expose the aggregate of concrete surfaces where concrete is to be placed to cover and encase the anchorage assemblies
2. Remove the ends of vents 1 inch below the roadway surface

50-1.03B(2)(d)(ii) Mixing and Proportioning

Proportion solids by weight to an accuracy of 2 percent.

Proportion liquids by weight or volume to an accuracy of 1 percent.

Mix the grout as follows:

1. Add water to the mixer followed by the other ingredients.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout without an excessive temperature increase or loss of properties of the mixture.
3. Do not exceed 5 gal of water per 94 lb of cement or the quantity of water in the manufacturer's instructions, whichever is less.
4. Agitate the grout continuously until the grout is pumped. Do not add water after the initial mixing.

50-1.03B(2)(d)(iii) Placing

Pump grout into the duct within 30 minutes of the 1st addition of the mix components.

Inject grout from the lowest point of the duct in an uphill direction in 1 continuous operation maintaining a one-way flow of the grout. You may inject from the lowest anchorage if complete filling is ensured.

Before injecting grout, open all vents.

Continuously discharge grout from the vent to be closed. Do not close any vent until free water, visible slugs of grout, and entrapped air have been ejected and the consistency of the grout flowing from the vent is equivalent to the injected grout.

Pump the grout at a rate of 16 to 50 feet of duct per minute.

Conduct grouting at a pressure range of 10 to 50 psi measured at the grout inlet. Do not exceed maximum pumping pressure of 150 psi at the grout inlet.

As grout is injected, close the vents in sequence in the direction of flow starting with the closest vent.

Before closing the final vent at the grout cap, discharge at least 2 gal of grout into a clean receptacle.

Bleed all high point vents.

Lock a pressure of 5 psi into the duct by closing the grout inlet valve.

50-1.03B(2)(d)(iv) Weather Conditions

If hot weather conditions will contribute to quick stiffening of the grout, cool the grout by authorized methods as necessary to prevent blockages during pumping activities.

If freezing weather conditions are anticipated during and following the placement of grout, provide adequate means to protect the grout in the ducts from damage by freezing.

50-1.03B(2)(d)(v) Curing

During grouting and for a period of 24 hours after grouting, eliminate vibration from contractor controlled sources within 100 feet of the span in which grouting is taking place, including from moving vehicles, jackhammers, large compressors or generators, pile driving activities, soil compaction, and falsework removal. Do not vary loads on the span.

For PC concrete members, do not move or disturb the members after grouting for 24 hours. If ambient temperature drops below 50 degrees F, do not move or disturb the members for 48 hours.

Do not remove or open valves until grout has cured for at least 24 hours.

50-1.03B(2)(d)(vi) Grouting Equipment

Grouting equipment must be:

1. Capable of grouting at a pressure of at least 100 psi
2. Equipped with a pressure gage having a full-scale reading of not more than 300 psi
3. Able to continuously grout the longest tendon on the project in less than 20 minutes

Grout must pass through a screen with clear openings of 1/16 inch or less before entering the pump.

Fit grout injection pipes, ejection pipes, and vents with positive mechanical shutoff valves capable of withstanding the pumping pressures. Do not remove or open valves until the grout has set. If authorized, you may substitute mechanical valves with suitable alternatives after demonstrating their effectiveness.

Provide a standby grout mixer and pump.

50-1.03B(2)(d)(vii) Grout Storage

Store grout in a dry environment.

50-1.03B(2)(d)(viii) Blockages

If the grouting pressure reaches 150 psi, close the inlet and pump the grout at the next vent that has just been or is ready to be closed as long as a one-way flow is maintained. Do not pump grout into a succeeding outlet from which grout has not yet flowed.

When complete grouting of the tendon cannot be achieved by the steps specified, stop the grouting operation.

50-1.03B(2)(d)(ix) Secondary Grouting

Perform secondary grouting by vacuum grouting under the direct supervision of a person who has been trained and has experience in the use of vacuum grouting equipment and procedures.

The vacuum grouting process must be able to determine the size of the void and measure the volume of grout filling the void.

7. Pipe culvert headwalls, endwalls, and wingwalls for a pipe with a diameter of 5 feet or greater

Falsework must comply with section 48-2.

Joints must comply with section 51-2.

Elastomeric bearing pads must comply with section 51-3.

Reinforcement for the following concrete structures must comply with section 52:

1. Sound wall footings
2. Sound wall pile caps
3. Barrier slabs
4. Junction structures
5. Minor structures
6. PC concrete members

You may use RSC for a concrete structure only where the specifications allow the use of RSC.

Replace "sets" in the 1st paragraph of section 51-1.01C(2) with:

copies

07-19-13

Replace the heading of section 51-1.01D(4) with:

Testing Concrete Surfaces

04-19-13

Add to section 51-1.01D(4)(a):

The Engineer tests POC deck surfaces for smoothness and crack intensity.

04-19-13

Add to the list in the 1st paragraph of section 51-1.01D(4)(b):

3. Completed deck surfaces, including ramps and landings of POCs

04-19-13

Replace the 4th paragraph in section 51-1.01D(4)(b) with:

Except for POCs, surface smoothness is tested using a bridge profilograph under California Test 547. Two profiles are obtained in each lane approximately 3 feet from the lane lines and 1 profile is obtained in each shoulder approximately 3 feet from the curb or rail face. Profiles are taken parallel to the direction of traffic.

04-19-13

Add between the 5th and 6th paragraphs of section 51-1.01D(4)(b):

POC deck surfaces must comply with the following smoothness requirements:

04-19-13

1. Surfaces between grade changes must not vary more than 0.02 foot from the lower edge of a 12-foot-long straightedge placed parallel to the centerline of the POC
2. Surface must not vary more than 0.01 foot from the lower edge of a 6-foot-long straightedge placed perpendicular to the centerline of the POC

Add to section 51-1.01D(4)(d):

04-19-13

The Engineer measures crack intensity of POC deck surfaces after curing, before prestressing, and before falsework release. Clean the surface for the Engineer to measure surface crack intensity.

In any 100 sq ft portion of a new POC deck surface, if there are more than 10 feet of cracks having a width at any point of over 0.02 inch, treat the deck with methacrylate resin under section 15-5.05. Treat the entire deck width between the curbs to 5 feet beyond where the furthest continuous crack emanating from the 100 sq ft section is 0.02 inch wide. Treat the deck surface before grinding.

Replace the 2nd paragraph of section 51-1.02B with:

07-19-13

Except for minor structures, the minimum required 28-day compressive strength for concrete in structures or portions of structures is the compressive strength described or 3,600 psi, whichever is greater.

Add to section 51-1.03C(2)(c)(i):

04-20-12

Permanent steel deck forms are only allowed where shown or if specified as an option in the special provisions.

Replace the 3rd paragraph of section 51-1.03C(2)(c)(ii) with:

04-20-12

Compute the physical design properties under AISI's *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Replace the 8th paragraph of section 51-1.03D(1) with:

10-19-12

Except for concrete placed as pipe culvert headwalls and endwalls, slope paving and aprons, and concrete placed under water, consolidate concrete using high-frequency internal vibrators within 15 minutes of placing concrete in the forms. Do not attach vibrators to or hold them against forms or reinforcing steel. Do not displace reinforcement, ducts, or prestressing steel during vibrating.

Add to section 51-1.03E(5):

08-05-11

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

Add to section 51-1.03F(5)(a):

04-19-13

For approach slabs, sleeper slabs, and other roadway surfaces of concrete structures, texture the roadway surface as specified for bridge deck surfaces in section 51-1.03F(5)(b).

Replace "Reserved" in section 51-1.03F(5)(b) with:

04-20-12

51-1.03F(5)(b)(i) General

Except for bridge widenings, texture the bridge deck surfaces longitudinally by grinding and grooving or by longitudinal tining.

10-19-12

For bridge widenings, texture the deck surface longitudinally by longitudinal tining.

04-20-12

In freeze-thaw areas, do not texture PCC surfaces of bridge decks.

51-1.03F(5)(b)(ii) Grinding and Grooving

When texturing the deck surface by grinding and grooving, place a 1/4 inch of sacrificial concrete cover on the bridge deck above the finished grade shown. Place items to be embedded in the concrete based on the final profile grade elevations shown. Construct joint seals after completing the grinding and grooving.

Before grinding and grooving, deck surfaces must comply with the smoothness and deck crack treatment requirements.

Grind and groove the deck surface as follows:

1. Grind the surface to within 18 inches of the toe of the barrier under section 42-3. Grinding must not reduce the concrete cover on reinforcing steel to less than 1-3/4 inches.
2. Groove the ground surfaces longitudinally under section 42-2. The grooves must be parallel to the centerline.

51-1.03F(5)(b)(iii) Longitudinal Tining

When texturing the deck surface by longitudinal tining, perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with spring steel tines that produce grooves parallel with the centerline.

The tines must:

1. Be rectangular in cross section
2. Be from 3/32 to 1/8 inch wide on 3/4-inch centers
3. Have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep

Construct grooves to within 6 inches of the layout line of the concrete barrier toe. Grooves must be from 1/8 to 3/16 inch deep and 3/16 inch wide after concrete has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand construct grooves. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Tining must not cause tearing of the deck surface or visible separation of coarse aggregate at the surface.

Add to section 51-1.03F:

04-19-13

51-1.03F(6) Finishing Pedestrian Overcrossing Surfaces

Construct deck surfaces, including ramps and landings of POCs to the grade and cross section shown. Surfaces must comply with the specified smoothness, surface texture, and surface crack requirements.

The Engineer sets deck elevation control points for your use in establishing the grade and cross section of the deck surface. The grade established by the deck elevation control points includes all camber allowances. Except for landings, elevation control points include the beginning and end of the ramp and will not be closer together than approximately 8 feet longitudinally and 4 feet transversely to the POC centerline. Landing elevation control points are at the beginning and the end of the landing.

Broom finish the deck surfaces of POCs. Apply the broom finish perpendicular to the path of travel. You may apply water mist to the surface immediately before brooming.

Clean any discolored concrete by abrasive blast cleaning or other authorized methods.

Replace the paragraphs of section 51-1.04 with:

10-19-12

If concrete involved in bridge work is not designated by type and is not otherwise paid for under a separate bid item, the concrete is paid for as structural concrete, bridge.

The payment quantity for structural concrete includes the volume in the concrete occupied by bar reinforcing steel, structural steel, prestressing steel materials, and piling.

The payment quantity for seal course concrete is the actual volume of seal course concrete placed except the payment quantity must not exceed the volume of concrete contained between vertical planes 1 foot outside the neat lines of the seal course shown. The Department does not adjust the unit price for an increase or decrease in the seal course concrete quantity.

Structural concrete for pier columns is measured as follows:

1. Horizontal limits are vertical planes at the neat lines of the pier column shown.
2. Bottom limit is the bottom of the foundation excavation in the completed work.
3. Upper limit is the top of the pier column concrete shown.

The payment quantity for drill and bond dowel is determined from the number and depths of the holes shown.

Replace section 51-2.01B(2) with:

04-19-13

51-2.01B(2) Reserved

04-19-13

Delete the 4th paragraph of section 51-2.01C.

Replace "SSPC-QP 3" in the 1st paragraph of section 51-2.02A(2) with:

10-19-12

AISC-420-10/SSPC-QP 3

Replace the 2nd and 3rd paragraphs of section 51-2.02B(3)(b) with:

04-20-12

Concrete saws for cutting grooves in the concrete must have diamond blades with a minimum thickness of 3/16 inch. Cut both sides of the groove simultaneously for a minimum 1st pass depth of 2 inches. The completed groove must have:

1. Top width within 1/8 inch of the width shown or ordered
2. Bottom width not varying from the top width by more than 1/16 inch for each 2 inches of depth
3. Uniform width and depth

Cutting grooves in existing decks includes cutting any conflicting reinforcing steel.

Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02D(1)(c)(ii) with:

copies

04-19-13

Replace "set" in the 7th paragraph of section 51-2.02D(1)(c)(ii) with:

copy

04-19-13

Add to the 1st paragraph of section 51-2.02D(3):

POC deck surfaces must comply with section 51-1.03F(6) before placing and anchoring joint seal assemblies.

04-19-13

Replace "sets" in the 2nd paragraph of section 51-2.02E(1)(c) with:

copies

04-19-13

Replace "set" in the 6th paragraph of section 51-2.02E(1)(c) with:

copy

04-19-13

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

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

08-05-11

Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02F(1)(c) with:

copies

04-19-13

Add between the 1st and 2nd paragraphs of section 51-4.01A:

Prestressing concrete members must comply with section 50.

10-19-12

Delete the 2nd paragraph of section 51-4.01A.

04-20-12

Replace the 3rd paragraph of section 51-4.01C(2) with:

For segmental or spliced-girder construction, shop drawings must include the following additional information:

04-20-12

1. Details showing construction joints or closure joints
2. Arrangement of bar reinforcing steel, prestressing tendons, and pressure-grouting pipe
3. Materials and methods for making closures
4. Construction joint keys and surface treatment
5. Other requested information

For segmental girder construction, shop drawings must include concrete form and casting details.

Replace "sets" in the 1st paragraph of section 51-4.01C(3) with:

copies

04-19-13

Delete the 1st and 2nd paragraphs of section 51-4.02A.

10-19-12

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

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

04-20-12

Add to section 51-4.02B(2):

At spliced-girder closure joints:

04-20-12

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

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

Add to section 51-4.03B:

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

04-20-12

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

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

Add to section 51-5.01A:

Structure excavation and backfill must comply with section 19-3.

07-19-13

Treated permeable base must comply with section 29.

12. Material specification and grade listed on the bill of materials.
13. Identification of tension members and fracture critical members.
14. Proposed deviations from plans, specifications, or previously submitted shop drawings.
15. Contract plan sheet references for details.

Replace items 2 and 3 in the list in the 1st paragraph of section 55-1.01C(3) with:

2. Tension flanges and webs of horizontally curved girders
3. Hanger plates

07-19-13

Replace the 2nd paragraph of section 55-1.01C(3) with:

Furnish plates, shapes, or bars with extra length to provide for removal of check samples.

07-19-13

Delete the 1st and 2nd sentences in the 3rd paragraph of section 55-1.01C(3).

07-19-13

Replace the 4th paragraph of section 55-1.01C(3) with:

Remove material for test samples in the Engineer's presence. Test samples for plates over 24 inches wide must be 10 by 12 inches with the long dimension transverse to the direction of rolling. Test samples for other products must be 12 inches long taken in the direction of rolling with a width equal to the product width.

07-19-13

Replace the 1st sentence of the 6th paragraph in section 55-1.01C(3) with:

Results of check testing are delivered to you within 20 days of receipt of samples at METS.

07-19-13

Delete the 2nd paragraph of section 55-1.01D(1).

07-19-13

Replace the 2nd sentence of the 4th paragraph in section 55-1.01D(1) with:

The calibration must be performed by an authorized repair and calibration center approved by the tool manufacturer.

07-19-13

Add to section 55-1.01D(1):

For bolts installed as snug tight, rotational capacity testing and installation tension testing are not required.

07-19-13

In addition to NDT requirements in AWS D1.5, ultrasonically test 25 percent of all main member tension butt welds in material over 1/2 inch thick.

Perform NDT on 100 percent of each pin as follows:

1. MT under ASTM A 788, S 18, with no linear indication allowed exceeding 3 mm
2. UT under ASTM A 788, S 20, level S and level DA in two perpendicular directions

The Engineer determines the location of all NDT testing for welding.

07-19-13

Delete the 2nd paragraph of section 55-1.01D(3)(a).

Replace section 55-1.01D(4)(b) with:

07-19-13

Perform rotational capacity testing on each rotational capacity lot under section 55-1.01D(3)(b) at the job site before installation.

Replace the 1st sentence of the 2nd paragraph in section 55-1.01D(4)(c) with:

07-19-13

Test 3 representative HS fastener assemblies under section 8 of *Specification for Structural Joints Using High-Strength Bolts* of the RCSC.

Replace the 1st paragraph in section 55-1.01D(4)(d) with:

07-19-13

Perform fastener tension testing to verify minimum tension in HS bolted connections no later than 48 hours after all fasteners in a connection have been tensioned.

Replace the 3rd paragraph in section 55-1.01D(4)(d) with:

07-19-13

Test 10 percent of each type of fastener assembly in each HS bolted connection for minimum tension using the procedure described in section 10 of *Specification for Structural Joints Using High-Strength Bolts* of the RCSC. Check at least 2 assemblies per connection. For short bolts, determine the inspection torque using steps 1 through 7 of "Arbitration of Disputes, Torque Method-Short Bolts" in *Structural Bolting Handbook* of the Steel Structures Technology Center.

Replace the 1st table in the 1st paragraph of section 55-1.02A(1) with:

07-19-13

Structural Steel	
Material	Specification
Carbon steel	ASTM A 709/A 709M, Grade 36 or {ASTM A36/A36M} ^a
HS low alloy columbium vanadium steel	ASTM A 709/A 709M, Grade 50 or {ASTM A 992/A 992M or ASTM A 572/A 572M, Grade 50} ^a
HS low alloy structural steel	ASTM A 709/A 709M, Grade 50W or Grade HPS 50W, or {ASTM A 588/A 588M} ^a
HS low alloy structural steel plate	ASTM A 709/A 709M, Grade HPS 70W
High-yield strength quenched and tempered alloy steel plate suitable for welding	ASTM A 709/A 709M, Grade 100, Grade 100W, or Grade HPS 100W, or {ASTM A 514/A 514M} ^a

^aGrades you may substitute for the equivalent ASTM A 709 steel subject to the modifications and additions specified and to the requirements of ASTM A 709.

Replace the 2nd table in the 1st paragraph of section 55-1.02A(1) with:

07-19-13

Fasteners	
Material	Specification
Steel fastener components for general applications:	
Bolts and studs	ASTM A 307
Anchor bolts	ASTM F 1554 ^a
HS bolts and studs	ASTM A 449, Type 1 ^a
HS threaded rods	ASTM A 449, Type 1 ^a
HS nonheaded anchor bolts	ASTM F 1554, Grade 105, Class 2A ^a
Nuts	ASTM A 563, including appendix X1 ^b
Washers	ASTM F 844
Hardened Washers	ASTM F 436, Type 1, including S1 supplementary requirements
Components of HS steel fastener assemblies for use in structural steel joints:	
Bolts	ASTM A 325, Type 1
Tension control bolts	ASTM F 1852, Type 1
Nuts	ASTM A 563, including appendix X1 ^b
Hardened washers	ASTM F 436, Type 1, Circular, including S1 supplementary requirements
Direct tension indicators	ASTM F 959, Type 325, zinc-coated

^aUse hardened washers.

^bZinc-coated nuts tightened beyond snug or wrench tight must be furnished with a dry lubricant complying with supplementary requirement S2 in ASTM A 563.

Replace the 3rd table in the 1st paragraph of section 55-1.02A(1) with:

07-19-13

Other Materials	
Material	Specification
Carbon steel for forgings, pins, and rollers	ASTM A 668/A 668M, Class D
Alloy steel for forgings	ASTM A 668/A 668M, Class G
Pin nuts	ASTM A 709/A 709M or ASTM A 563, including appendix X1 ^a
Carbon-steel castings	ASTM A 27/A 27M, Grade 65-35, Class 1
Malleable iron castings	ASTM A 47/A 47M, Grade 32510
Gray iron castings	ASTM A 48, Class 30B
Carbon steel structural tubing	ASTM A 500/A 500M, Grade B, ASTM A 501, ASTM A 847/A 847M, or ASTM A 1085
Steel pipe ^b	ASTM A 53, Type E or S, Grade B; ASTM A 106, Grade B; or ASTM A 139, Grade B
Stud connectors	ASTM A 108

^aZinc-coated nuts tightened beyond snug or wrench tight must be furnished with a dry lubricant complying with supplementary requirement S2 in ASTM A 563.

^bHydrostatic testing will not apply.

Replace the table in the 1st paragraph in section 55-1.02A(2) with:

07-19-13

Material complying with ASTM A 709/A 709M	CVN impact value (ft-lb at temperature)
Grade 36	15 at 40 °F
Grade 50 ^a (Thickness up to 2 inches)	15 at 40 °F
Grade 50W ^a (Thickness up to 2 inches)	15 at 40 °F
Grade 50 ^a (Thickness over 2 inches up to 4 inches)	20 at 40 °F
Grade 50W ^a (Thickness over 2 inches up to 4 inches)	20 at 40 °F
Grade HPS 50W ^a (Thickness up to 4 inches)	20 at 10 °F
Grade HPS 70W (Thickness up to 4 inches)	25 at -10 °F
Grade 100 (Thickness of 2-1/2 inches or less)	25 at 0 °F
Grade 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at 0 °F
Grade HPS 100W (Thickness of 2-1/2 inches or less)	25 at -30 °F
Grade HPS 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at -30 °F

^aIf the material yield strength is more than 65,000 psi, reduce the temperature for the CVN impact value 15 degrees F for each increment of 10,000 psi above 65,000 psi.

Replace the 1st sentence of the 1st paragraph in section 55-1.02A(5) with:

07-19-13

Steel, gray iron, and malleable iron castings must have continuous fillets cast in place in reentrant angles.

Delete the 3rd and 4th sentences in the 2nd paragraph in section 55-1.02A(5).

07-19-13

Replace the 1st paragraph of section 55-1.02B(1) with:

07-19-13

Section 55-1.02B(1) applies to work performed at the source and at the job site.

Replace the 4th paragraph in section 55-1.02B(1) with:

07-19-13

Ends of girder stiffeners shown as tight-fit must bear on the girder flange with at least point bearing. Local clearances between the end of the stiffener and the girder flange must be at most 1/16 inch.

Replace the 1st sentence of the 5th paragraph in section 55-1.02B(1) with:

07-19-13

Fabricate floor beams, stringers, and girders having end connection angles to exact length back to back of connection angles.

Add to the 7th paragraph in section 55-1.02B(1):

07-19-13

Use low-stress stamps for fracture critical members and tension members.

Replace the 2nd sentence of the 9th paragraph in section 55-1.02B(1) with:

07-19-13

Slightly round edges and sharp corners, including edges marred, cut, or roughened during handling or erection.

Replace the 3rd paragraph in section 55-1.02B(2) with:

07-19-13

Instead of machining, you may heat straighten steel not in contact with other metal bearing surfaces if the above tolerances are met.

Replace item 2 in the list in the 1st paragraph of section 55-1.02B(3) with:

07-19-13

2. Radius of bend measured to the concave face must comply with *Manual of Steel Construction* of the AISC

Replace the 1st sentence of the 2nd paragraph in section 55-1.02B(3) with:

07-19-13

Plates to be bent to a smaller radius than specified in *Manual of Steel Construction* of the AISC must be bent hot.

Replace the introductory clause of the 2nd paragraph of section 55-1.02B(4) with:

07-19-13

Threads for pin ends and pin nuts 1-1/2 inches or more in diameter must comply with the following:

Replace the 3rd paragraph in section 55-1.02B(5) with:

07-19-13

Holes for pins must be:

1. True to the diameter specified.
2. At right angles to the member axis.
3. Parallel with each other except for pins where nonparallel holes are required.
4. Smooth and straight with the final surface produced by a finishing cut.

Replace the 1st paragraph in section 55-1.02B(6)(c) with:

07-19-13

Bolted connections using HS fastener assemblies must comply with *Specification for Structural Joints Using High-Strength Bolts* of the RCSC.

Replace the 7th paragraph in section 55-1.02B(6)(c) with:

07-19-13

For all bolts, thread stickout after tensioning must be at least flush with the outer nut face. At least 3 full threads must be located within the grip of the connection.

07-19-13

Delete the 3rd paragraph in section 55-1.02B(7)(a).

Add to section 55-1.02B(7)(a):

07-19-13

For welds indicated to be subject to tensile forces that are to receive RT, grind smooth and flush on both sides of welds before testing.

For groove weld surface profiles that interfere with NDT procedures, grind welds smooth and blend with the adjacent material.

For fillet weld surface profiles that interfere with NDT procedures, grind welds and blend the toes smoothly with the adjacent base metal.

Add to section 55-1.02B(7):

07-19-13

55-1.02B(7)(c) Steel Pedestrian Bridges

Reserved

Replace the 1st paragraph in section 55-1.02B(9) with:

07-19-13

Prepare and paint contact surfaces of HS bolted connections before assembly. Thoroughly clean all other surfaces of metal in contact to bare metal before assembly. Remove all rust, mill scale, and foreign material.

Replace the 1st sentence of the 4th paragraph in section 55-1.02B(9) with:

07-19-13

Preassemble truss work in lengths of at least 3 abutting panels and adjust members for line and camber.

Replace the 1st sentence of the 5th paragraph in section 55-1.02B(9) with:

07-19-13

Preassemble bolted splice joints for plate girders in lengths of at least 3 abutting sections and adjust abutting sections for line and camber.

Replace the 6th paragraph in section 55-1.02B(9) with:

07-19-13

Preassemble prepared splice joints for welded girders with abutting members and adjust for line and camber.

Replace the paragraphs in section 55-1.03C(1) with:

07-19-13

Reserved

Replace the 3rd sentence of the 1st paragraph in section 55-1.03C(2) with:

07-19-13

Attain full bearing on the concrete under bearing assemblies.

59 PAINTING

11-15-13

Replace "SSPC-SP 10" at each occurrence in section 59 with:

SSPC-SP 10/NACE no. 2

10-19-12

Replace "SSPC-SP 6" at each occurrence in section 59 with:

SSPC-SP 6/NACE no. 3

10-19-12

Replace "SSPC-CS 23.00" at each occurrence in section 59 with:

SSPC-CS 23.00/AWS C 2.23M/NACE no. 12

10-19-12

Replace "*Specification for Structural Joints Using ASTM A325 or A 490 Bolts*" in the 1st paragraph of section 59-2.01C(1) with:

Specification for Structural Joints Using High-Strength Bolts

07-19-13

Replace "SSPC-QP 3 or AISC SPE, Certification P-1 Enclosed" in item 3 in the list in the 1st paragraph of section 59-2.01D(1) with:

AISC-420-10/SSPC-QP 3 (Enclosed Shop)

10-19-12

Replace "*Specification for Structural Joints Using ASTM A325 or A 490 Bolts*" in the 1st paragraph of section 59-2.02 with:

Specification for Structural Joints Using High-Strength Bolts

07-19-13

Replace the paragraphs in section 59-2.03A with:

Clean and paint all exposed structural steel and other metal surfaces.

10-19-12

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

Except for blast cleaning within closed buildings, perform blast cleaning and painting during daylight hours.

Add to section 59-2.03B:

07-19-13

59-2.03B(3) Containment Systems

59-2.03B(3)(a) General

Construct containment systems when disturbing existing paint systems during bridge rehabilitation.

The containment system must be one of the following:

1. Ventilated containment system
2. Vacuum-shrouded surface preparation equipment and drapes and ground covers
3. Equivalent containment system if authorized

The containment system must contain all water, resulting debris, and visible dust produced when the existing paint system is disturbed.

Properly maintain the containment system while work is in progress and do not change the containment system unless authorized.

Containment systems over railroad property must provide the minimum clearances as specified in section 5-1.20C for the passage of railroad traffic.

59-2.03B(3)(b) Ventilated Containment Systems

59-2.03B(3)(b)(i) General

If flexible framing is used, support and fasten it to (1) prevent the escape of abrasive and blast materials due to whipping from traffic or wind and (2) maintain clearances.

If the wind speed reaches 50 mph or greater, relieve the wind pressure on the containment system using an authorized method.

59-2.03B(3)(b)(ii) Design Criteria

Scaffolding or supports for the ventilated containment system must not extend below the vertical clearance level nor to the ground line at locations within the roadbed.

For truss-type bridges, all connections of the ventilated containment system to the existing structure must be made through the deck, girder, stringer, or floor beam system. No connections are allowed that will cause bending stresses in a truss member.

The ventilated containment system must comply with section 7-1.02K(6)(e).

The minimum total design load for the ventilated containment system must consist of the sum of the dead and live vertical loads.

Dead and live loads are as follows:

1. Dead load must consist of the actual load of the ventilated containment system
2. Live loads for bridges with only spot blast cleaning work must consist of:
 - 2.1. Uniform load of at least 25 psf applied over the supported area
 - 2.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system
3. Live loads for bridges with 100 percent blast cleaning to bare metal must consist of:
 - 3.1. Uniform load of at least 45 psf, which includes 20 psf of sand load, applied over the supported area
 - 3.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system

Assumed horizontal loads do not need to be included in the design of the ventilated containment system.

Maximum allowable stresses must comply with section 48-2.01D(3)(c).

59-2.03B(3)(b)(iii) Ventilation

The ventilation system in the ventilated containment system must be of the forced input airflow type with fans or blowers.

Negative air pressure must be employed within the ventilated containment system and will be verified by visual methods by observing the concave nature of the ventilated containment system while taking into account wind effects or by using smoke or other visible means to observe airflow. The input airflow must be properly balanced with the exhaust capacity throughout the range of operations.

The exhaust airflow of the ventilation system in the ventilated containment system must be forced into wet or dry dust collectors or bag houses.

Replace item 1 in the list in the 2nd paragraph of section 59-2.03C(1) with:

10-19-12

1. Apply a stripe coat of undercoat paint on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. The stripe coat must completely hide the surface being covered. If spot blast cleaning portions of the bridge, apply the stripe coat of undercoat paint before each undercoat and follow with the undercoat as soon as practical. If removing all existing paint from the bridge, apply the undercoat first as soon as practical and follow with the stripe coat of undercoat paint for each undercoat.

Replace the heading of section 59-2.03C(2) with:

04-19-13

Zinc Coating System

Add to section 59-2.03C(2)(a):

04-19-13

Coatings for new structural steel and connections between new and existing structural steel must comply with the requirements shown in the following table:

Zinc Coating System

Description	Coating	Dry film thickness (mils)
All new surfaces:		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4-8
Finish coat ^a	Exterior grade latex ^b , 2 coats	2 minimum each coat, 4-8 total
Total thickness, all coats		8-14
Connections to existing structural steel: ^c		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4-8
Finish coat ^a	Exterior grade latex ^b , 2 coats	2 minimum each coat, 4-8 total
Total thickness, all coats		8-14

^aIf no finish coats are described, a final coat of inorganic zinc primer is required.

^bExterior grade latex must comply with section 91-2.02 unless otherwise specified.

^cIncludes the following locations:

1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or flame cutting

Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 7th paragraph of section 59-2.03C(2)(b)(i) with:

07-19-13

Specification for Structural Joints Using High-Strength Bolts

Add to section 59-2.03C:

04-19-13

59-2.03C(3) Moisture-Cured Polyurethane Coating System

Reserved

59-2.03C(4) State Specification Paint Waterborne Coating System

59-2.03C(4)(a) General

The State Specification PWB coating system for existing structural steel must comply with the requirements shown in the following table:

State Specification PWB Coating System

Surface	Description	State Specification PWB Coating	Dry film thickness (mils)
Surfaces cleaned to bare metal ^a :	1st undercoat	145	2-3
	2nd undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, all coats	--	7-12
Existing painted surfaces to be topcoated:	Undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, new coats	--	5-9

^aIncludes locations of spot blast cleaning

59-2.03C(4)(b) Finish Coats

11-15-13

Reserved

Add to section 59-5.01:

04-19-13

Where specified, prepare and paint sign structures under sections 59-2 and 59-3.

Instead of submitting proof of the certification complying with SSPC-QP 1, you may submit documentation with the painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1.

Instead of submitting proof of the certification complying with SSPC-QP 2, you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 4.2 through 4.4 of SSPC-QP 2, Category A.

Instead of submitting proof of the certification complying with AISC-420-10/SSPC-QP 3 (Enclosed Shop), you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP3.

Replace the paragraphs of section 59-5.03 with:

04-19-13

59-5.03A General

You may prepare and paint sign structures before or after erection. After erection, repair damaged paint to the satisfaction of the Engineer.

The total dry film thickness of finish coats on contact surfaces of galvanized HS bolted connections (1) must be from 1 to 4 mils and (2) may be applied in 1 application.

59-5.03B Undercoating of Ungalvanized Surfaces

Blast-cleaned surfaces must receive a single undercoat consisting of an inorganic zinc coating as specified in AASHTO M 300, Type I or Type II, except:

1. The first 2 sentences of section 5.6 do not apply
2. Section 5.6.1 does not apply

If you propose to use a coating that is not on the Authorized Material List, submit the required documentation specified in section 5.6 of AASHTO M 300. Allow 30 days for the Engineer's review.

59-5.03C Testing of Inorganic Zinc Coating

Perform adhesion and hardness testing no sooner than 72 hours after application of the single undercoat of inorganic zinc coating.

59-5.03D Finish Coating

The exposed area of inorganic zinc coating must receive a minimum of 2 finish coats of exterior grade latex paint.

The 1st finish coat color must match no. 24558 of FED-STD-595. The 2nd finish coat color must match no. 24491 of FED-STD-595. The total dry film thickness of the applications of the 2nd finish coat must be not less than 2 mils.

Replace section 59-7 with:

07-19-13

59-7 STAINING CONCRETE AND SHOTCRETE

59-7.01 GENERAL

59-7.01A General

59-7.01A(1) Summary

Section 59-7.01 includes specifications for preparing and staining concrete and shotcrete surfaces using an acid stain.

59-7.01A(2) Definitions

Reserved

59-7.01A(3) Submittals

Submit stain manufacturer's product data and application instructions at least 7 days before starting staining activities.

59-7.01A(4) Quality Control and Assurance

Reserved

59-7.01B Materials

59-7.01B(1) General

Reserved

59-7.01B(2) Stain

Stain must:

1. Be a water-based solution of inorganic metallic salts
2. Contain dilute acid that penetrates and etches the concrete or shotcrete surface
3. Be a commercial quality product designed specifically for exterior applications
4. Produce abrasion-resistant color deposits

59-7.01B(3) Sealer

Reserved

59-7.01B(4) Joint Sealing Compound

Reserved

59-7.01C Construction

59-7.01C(1) General

Seal joints between concrete and shotcrete surfaces to be stained and adjacent metal with joint sealing compound before applying the stain.

Test surfaces for acceptance of the stain before applying the stain. Clean surfaces that resist accepting the stain and retest until passing.

Apply the stain under the manufacturer's instructions.

Before staining, the concrete or shotcrete surfaces must be:

1. At least 28 days old
2. Prepared under SSPC-SP 13/NACE no. 6
3. Thoroughly dry

Apply the stain uniformly to avoid excessive rundown. Work the stain into the concrete using a nylon bristle brush in a circular motion.

After the last coat of stain has dried, rinse stained surfaces with water and wet scrub with a stiff bristle nylon brush until the rinse water runs clear. Collect all rinse water.

Protect adjacent surfaces during staining.

Thoroughly cure each application of the stain and correct skips, holidays, thin areas, or other deficiencies before the next application.

Drips, puddles, or other irregularities must be worked into the concrete or shotcrete surface.

59-7.01C(2) Test Panel

For staining concrete or shotcrete, stain a test panel complying with section 51-1.01D(3).

For staining sculpted shotcrete, stain a test panel complying with section 53-3.01D(3).

The test panel must be:

1. Stained using the same personnel, materials, equipment and methods to be used in the work
2. Accessible for viewing
3. Displayed in an upright position near the work
4. Authorized for staining before starting the staining work

If ordered, construct additional test panels until a satisfactory color is attained.

The Engineer uses the authorized stained test panel to determine the acceptability of the stained surface.

Dispose of the test panels after the staining work is complete and authorized. Notify the Engineer before disposing of the test panels.

59-7.01D Payment

Not Used

59-7.02 SCULPTED SHOTCRETE AND TEXTURED CONCRETE

59-7.02A General

59-7.02A(1) Summary

Section 59-7.02 includes specifications for preparing and staining sculpted shotcrete and textured concrete surfaces using an acid stain.

59-7.02A(2) Definitions

Reserved

59-7.02A(3) Submittals**59-7.02A(3)(a) General**

Reserved

59-7.02A(3)(b) Experience Qualifications

Submit the following documentation of the staining subcontractor's experience at least 10 days before the preconstruction meeting:

1. Summary of the staining subcontractor's experience that demonstrates compliance with section 59-7.02A(4)(b).
2. List of at least 3 projects completed in the last 5 years that demonstrate the staining subcontractor's ability to stain textured concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project. For each project include:
 - 2.1. Project description
 - 2.2. Name and phone number of the owner
 - 2.3. Staining completion date
 - 2.4. Color photos of the completed stained surface

59-7.02A(3)(c) Installation Plan

Submit an installation plan at least 10 days before the preconstruction meeting. The installation plan must include details for preparing and staining the textured concrete or sculpted shotcrete to achieve the required color, including:

1. Number of applications that will be used to apply the stain
2. For each application of the stain, a description of:
 - 2.1. Manufacturer, color, finish, and percentage strength mixture of the stain that will be applied
 - 2.2. Methods and tools that will be used to apply the stain
3. Methods for protecting adjacent surfaces during staining
4. Rinse water collection plan for containing all liquid, effluent, and residue resulting from preparing and staining textured concrete or sculpted shotcrete

59-7.02A(4) Quality Control and Assurance**59-7.02A(4)(a) General**

Reserved

59-7.02A(4)(b) Contractor Qualifications

The staining subcontractor must:

1. Have experience in staining textured concrete or sculpted shotcrete surfaces to simulate the appearance of natural rock formations or stone masonry
2. Have successfully completed at least 3 projects in the past 5 years involving staining of concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project

59-7.02A(4)(c) Preconstruction Meeting

Before starting staining activities, conduct a meeting to discuss the installation plan. Meeting attendees must include the Engineer and all staining subcontractors.

59-7.02B Materials

Not Used

59-7.02C Construction

Not Used

59-7.02D Payment

Prepare and stain concrete and prepare and stain shotcrete are measured by the area of the vertical or sloped wall face stained.

Replace "solider" in the 5th paragraph of section 59-9.03 with:

soldier

04-19-13

Replace section 59-11 with:

59-11 STAINING GALVANIZED SURFACES

07-19-13

Reserved

Replace section 59-12 with:

59-12 ROCK STAINING

07-19-13

59-12.01 GENERAL

59-12.01A Summary

Section 59-12 includes specifications for applying stain to the exterior surface of landscape boulders, native rock that has been damaged or scarred, rock energy dissipaters, rock slope protection and gabion surfaces.

59-12.01B Submittals

Submit the following:

1. Work plan showing methods to control overspray and spillage, and to protect adjacent surfaces
2. Product data including the manufacturer's product sheet and the instructions for the application of the stain

59-12.01C Quality Control and Assurance

59-12.01C(1) General

Reserved

59-12.01C(2) Test Plot

Apply the stain to a test plot rock area of at least 3 by 3 feet at a location designated by the Engineer. Notify the Engineer at least 7 days before staining the test plot. Prepare and stain the test plot with the same materials, tools, equipment, and methods to be used in staining the final surfaces. Separate test plots are required for staining rock slope protection and native rock.

If ordered, prepare additional test plots. Additional test plots are change order work.

Obtain authorization of the test plot before starting the staining work. Use the authorized test plot as the standard for comparison in determining acceptability of staining. If the test plot is not incorporated into the work and the Engineer determines it is no longer needed, dispose of it.

59-12.02 MATERIALS

59-12.02A General

Reserved

59-12.02B Stain

Reserved

59-12.03 CONSTRUCTION

59-12.03A General

Reserved

59-12.03B Preparation

Before applying the stain:

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

74 PUMPING EQUIPMENT AND CONTROLS

04-19-13

Replace the 1st paragraph of section 74-1.01C(3) with:

04-19-13

Submit at least 5 copies of product data to OSD, Documents Unit. Each copy must be bound together and include an index stating equipment names, manufacturers, and model numbers. Two copies will be returned. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.

Replace the 1st sentence of the 1st paragraph in section 74-2.01D(2) with:

01-20-12

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

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

75 MISCELLANEOUS METAL

07-19-13

Add between 2nd and 3rd paragraphs of section 75-1.03A:

07-19-13

Fabricate expansion joint armor from steel plates, angles, or other structural shapes. Shape the armor to the section of the concrete deck and match-mark it in the shop. Straighten warped sections of expansion joint armor before placing. Secure the expansion joint armor in the correct position during concrete placement.

Replace "SSPC-QP 3" in the 3rd paragraph of section 75-1.03E(4) with:

10-19-12

AISC-420-10/SSPC-QP3

Replace "metal beam guard railing" in the table in the 1st paragraph of section 75-1.05 with:

07-19-13

guardrail

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Replace section 78 with:

07-20-12

78 INCIDENTAL CONSTRUCTION

07-20-12

78-1 GENERAL

Section 78 includes specifications for incidental bid items that are not closely associated with other sections.

78-2-78-50 RESERVED

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

80 FENCES

10-19-12

Add to section 80-2.02D:

10-19-12

Vertical stays must:

- 1. Comply with ASTM A641
- 2. Be 12-1/2 gage
- 3. Have a Class 3 zinc coating

Replace item 1 in the list in section 80-2.02E with:

10-19-12

Comply with ASTM A 116, Type Z, Grade 60, Class 1

Add after "galvanized wire" in the 1st paragraph of section 80-2.02F:

10-19-12

complying with ASTM A 641

Replace the 3rd and 4th paragraphs of section 80-2.02F with:

10-19-12

Each staple used to fasten barbed wire and wire mesh fabric to wood posts must:

- 1. Comply with ASTM F 1667
- 2. Be at least 1-3/4 inches long
- 3. Be manufactured from 9-gage galvanized wire

Wire ties used to fasten barbed wire and wire mesh to metal posts must be at least 11-gage galvanized wire complying with ASTM F 626. Clips and hog rings used for metal posts must be at least 9-gage galvanized wire complying with ASTM F 626.

Replace the 8th through 14th paragraphs of section 80-2.03 with:

10-19-12

Attach the wire mesh and barbed wire to each post.

Securely fasten tension wires to wood posts. Make a single or double loop around each post at each attachment point and staple the wire to the post. Use wire ties, hog rings, or wire clips to fasten the wires to the metal posts.

Connect each wood brace to its adjacent post with a 3/8 by 4-inch steel dowel. Twist the tension wires until the installation is rigid.

Stretch barbed wire and wire mesh fabric and fasten to each wood or steel end, corner, or gate post. Apply tension according to the manufacturer's instructions using a mechanical stretcher or other device designed for such use. If no tension is specified by the manufacturer, use 250 pounds for the required tension. Evenly distribute the pull over the longitudinal wires in the wire mesh such that no more than 50 percent of the original depth of the tension curves is removed. Do not use a motorized vehicle, truck, or tractor to stretch the wire.

Attach barbed wire and wire mesh fabric to the private-property side of posts. On curved alignments, place the wire mesh and barbed wire on the face of the post against which the normal pull of the wire

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

01-20-12

Replace the 1st paragraph in section 84-2.04 with:

01-20-12

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

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

Add to section 84:

01-20-12

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

Reserved

84-7-84-10 RESERVED

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86 ELECTRICAL SYSTEMS

11-15-13

Replace the paragraphs in section 86-1.01 with:

07-19-13

Section 86 includes general specifications for constructing and rehabilitating electrical systems.

Electrical systems must comply with the material and installation specifications in section 86-2.

Section 86-3 includes specifications for constructing controller assemblies.

Section 86-4 includes specifications for constructing traffic signal faces, programmed visibility signal faces, pedestrian signal faces, flashing beacons, ramp metering signs, and signal mounting assemblies.

Section 86-5 includes specifications for constructing vehicle detectors and pedestrian push button assemblies.

Section 86-6 includes specifications for constructing lighting systems.

Section 86-7 includes specifications for constructing rehabilitating electrical equipment.

Comply with Part 4 of the *California MUTCD*. Nothing in section 86 is to be construed as to reduce the minimum standards in this manual.

The locations shown for electrical systems are approximate; the Engineer determines the final locations.

Replace the paragraphs in section 86-1.015 with:

07-19-13

actuation: Actuation as defined in the *California MUTCD*.

channel: Discrete information path.

controller assembly: Assembly for controlling a system's operations, consisting of a controller unit and auxiliary equipment housed in a rainproof cabinet.

controller unit: Part of the controller assembly performing the basic timing and logic functions.

- detector:** Detector as defined in the *California MUTCD*.
- electrolier:** Assembly of a lighting standard and luminaire.
- flasher:** Device for opening and closing signal circuits at a repetitive rate.
- flashing beacon control assembly:** Assembly of switches, circuit breakers, terminal blocks, flasher, wiring, and other necessary electrical components housed in a single enclosure for operating a beacon.
- inductive loop detector:** Detector capable of being actuated by an inductance change caused by a vehicle passing or standing over the loop.
- lighting standard:** Pole and mast arm supporting the luminaire.
- luminaire:** Assembly that houses the light source and controls the light emitted from the light source.
- magnetic detector:** Detector capable of being actuated by an induced voltage caused by a vehicle passing through the earth's magnetic field.
- powder coating:** Coating applied electrostatically using exterior-grade UV-stable polymer powder.
- pretimed controller assembly:** Assembly operating traffic signals under a predetermined cycle length.
- pull box:** A box with a cover that is installed in an accessible place in a run of conduit to facilitate the pulling in of wires or cables.
- signal face:** Signal face as defined in the *California MUTCD*.
- signal head:** Signal head as defined in the *California MUTCD*.
- signal indication:** Signal indication as defined in the *California MUTCD*.
- signal section:** Signal section as defined in the *California MUTCD*.
- signal standard:** Pole and mast arm supporting 1 or more signal faces with or without a luminaire mast arm.
- traffic-actuated controller assembly:** Assembly for operating traffic signals under the varying demands of traffic as registered by detector actuation.
- traffic phase:** Signal phase as defined in the *California MUTCD*.
- vehicle:** Vehicle as defined in the *California Vehicle Code*.

Replace the paragraphs in section 86-1.02 with:

07-19-13

Comply with 8 CA Code of Regs § 2299 et seq.

Electrical equipment must comply with one or more of the following standards:

1. ANSI
2. ASTM
3. EIA
4. NEMA
5. NETA
6. UL
7. Public Utilities Commission, General Order No. 95, "Rules for Overhead Electrical Sign Construction"
8. Public Utilities Commission, General Order No. 128, "Rules for Construction of Underground Electric Supply and Communication Systems"

Materials and workmanship must comply with:

1. FCC rules

2. ITE standards
3. NEC
4. California Electrical Code

Electrical equipment and materials must be NRTL certified wherever applicable.

Replace the paragraphs in section 86-1.03 with:

07-19-13

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

Determine the quantities required to complete the work. Submit the quantities as part of the schedule of values.

Provide a schedule of values for each lump sum bid item.

Do not include costs for the traffic control system in the schedule of values.

The schedule of values must include the type, size, and installation method for:

1. Foundations
2. Standards and poles
3. Conduit
4. Pull boxes
5. Conductors and cables
6. Service equipment enclosures
7. Telephone demarcation cabinets
8. Vehicle signal heads and hardware
9. Pedestrian signal heads and hardware
10. Push buttons
11. Loop detectors
12. Luminaires and lighting fixtures
13. Materials shown in the quantity tables on plan sheets labeled *E*

Replace the paragraphs in section 86-1.04 with:

07-19-13

Within 15 days of Contract approval, submit a list of equipment and materials that you propose to install. Submit the list before shipping equipment or materials to the job site. The list must include the following information:

1. Manufacturer's name
2. Make and model number
3. Month and year of manufacture
4. Lot and serial numbers
5. Dimensions
6. List of components
7. Manufacturer's installation instructions
8. Contract number
9. Your contact information

Supplement the list with 2 copies of the following data:

1. Schematic wiring diagrams
2. Scale drawings of cabinets showing location and spacing of shelves, terminal blocks, and equipment, including dimensions
3. Operation manual

Electrical equipment constructed as shown does not require detailed drawings and diagrams.

Submit 3 sets of computer-generated schematic wiring diagrams for the cabinet.

Place the schematic wiring diagram in a heavy-duty plastic envelope and attach it to the inside of the cabinet door.

Prepare diagrams, plans, and drawings using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

Replace the 5th paragraph of section 86-2.04B(2) with:

07-19-13

HS bolts, nuts, and flat washers used to connect slip base plates must comply with the requirements for HS fastener assemblies for use in structural steel joints in section 55-1.02A(1) except rotational capacity testing and tension testing are not required.

Delete the row for standard Type 36-20A in the table in the 6th paragraph of section 86-2.04B(2).

07-19-13

Replace the 10th paragraph of section 86-2.04B(2) with:

07-19-13

Bolted connections attaching signal or luminaire arm to the pole must be considered slip critical. Galvanized faying surfaces of plates on luminaire arm, signal arm, and pole must be roughened by hand using a wire brush before assembly and must comply with requirements for Class C surface conditions for slip-critical connections in *Specification for Structural Joints Using High-Strength Bolts* of the RCSC. Coatings for faying surfaces must comply with the RCSC specification for Class B coatings.

Replace the 1st sentence of item 8 in the list in the 1st paragraph of section 86-2.04B(3) with:

07-19-13

During manufacturing, longitudinal seams on vertical tubular members of cantilevered support structures must be within 90 degrees circumferentially of the center of the longest mast arm connection.

Delete item 15.3 in the list in the 1st paragraph of section 86-2.04B(3).

07-19-13

Add between "Exposed" and "conduit" in the 2nd paragraph of section 86-2.05B:

07-19-13

Type 1

Replace the 1st sentence of the 10th paragraph of section 86-2.05C with:

07-19-13

After installing conduit, install the pull tape.

Replace the 1st sentence of the 15th paragraph of section 86-2.05C with:

11-15-13

Conduit runs shown to be located behind curbs may be installed in the street within 3 feet of and parallel to the face of the curb by the trenching in pavement method.

Replace the 1st and 2nd sentences of the 2nd paragraph of section 86-2.05D with:

07-19-13

Install an expansion-deflection fitting for expansion joints with a 1-1/2-inch movement rating. The fitting must be watertight and include a molded neoprene sleeve, a bonding jumper, and 2 silicon bronze or zinc-plated iron hubs.

Replace section 86-2.06 with:

07-19-13

86-2.06 PULL BOXES

86-2.06A General

86-2.06A(1) Cover Marking

The cover marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of the cover.

Marking letters must be 1 to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4-inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4-inch stainless steel rivets or 1/4-inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover such that the letters are raised a minimum of 3/32 inch.

86-2.06A(2) Installation and Use

Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of the pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place grout over the layer of roofing paper. Grout must be 0.50 to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in the center of the pull box through the grout and roofing paper.
5. Place grout between the pull box and the pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

86-2.06B Non-Traffic Pull Boxes

Reserved

86-2.06C Traffic Pull Boxes

The traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20 loading. You must be able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

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

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

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

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

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

Replace the 11th row in the table in the 1st paragraph of section 86-2.08B with:

07-19-13

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

Replace the 1st sentence of the 1st paragraph of section 86-2.08C with:

07-19-13

Circuit conductors, connectors, and terminals must be UL or NRTL listed and rated for 600 V(ac) operation.

Add to the beginning of section 86-2.09A:

07-19-13

Provide enough traffic signal light conductors for functional operation of the signal. Provide 3 spare conductors in all conduits containing traffic signal light conductors.

Replace the paragraphs in section 86-2.09C with:

07-19-13

Connectors must be crimp type. Use a manufacturer-recommended tool for connectors and terminals to join conductors. Comply with SAE-AS7928.

Terminate stranded conductors smaller than no. 14 in crimp style terminal lugs.

Terminate field conductors no. 12 and smaller with spade type terminals. Terminate field conductors no. 10 and larger with spade type or ring type terminals.

Replace the value for resistivity in the table in the 6th paragraph of section 86-2.09E with:

07-19-13

25 x 10¹³ Ω per inch, minimum

Add between "the" and "head" in the 3rd sentence of the 2nd paragraph of 86-2.09F:

connector

07-19-13

Replace "project" in the 3rd paragraph of section 86-2.11A with:

work

10-19-12

Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:

work

10-19-12

Delete the 12th paragraph of section 86-2.11A.

07-19-13

Replace section 86-2.11C with:

86-2.11C Electrical Service for Booster Pumps

07-19-13

Provide electrical service from the service point to the booster pump.

Furnish conductors, conduit, and pull boxes from the service point to the booster pump.

Do not use Type 3 conduit unless shown otherwise.

Replace section 86-2.14A with:

07-19-13

86-2.14A General

Deliver material and equipment for acceptance testing to either METS or a testing location as ordered.

Allow 30 days for testing. The Department notifies you when testing is complete. You must pick up the material or equipment from the test site and deliver it to the job site.

If material or equipment is rejected, allow 30 days for retesting. The retesting period starts when replacement material or equipment is delivered to the test site.

If material or equipment submitted for testing does not comply with the specifications, remove it within 5 business days after you are notified that the equipment is rejected. If equipment is not removed within that period, the Department may ship it to you and deduct the shipping cost.

Testing and quality control procedures for traffic signal controller assemblies must comply with NEMA TS standards for traffic control systems.

Replace the 2nd paragraph of section 86-3.02A(1) with:

The Department furnishes the BBS components under section 6-2.03.

07-19-13

Replace the 9th paragraph of section 86-3.02B with:

07-19-13

The couplings between the external cabinet and Model 332L cabinet must include a conduit for power connections between the 2 cabinets. Couplings must include:

1. 2-inch nylon-insulated steel chase nipple
2. 2-inch sealing steel locknut
3. 2-inch nylon-insulated steel bushing

Delete item 1.3 in the list in the 7th paragraph of section 86-3.04A.

07-19-13

Replace the 2nd paragraph of section 86-4.01A with:

07-19-13

The housing must not fail structurally as described in the following table:

Housing Structural Failure

Housing type	Test method	Description of structural failure
Metal	California Test 666	Fracture within the housing assembly or deflection of more than half the lens diameter of the signal section during the wind load test
Plastic	California Test 605	Fracture within the housing assembly or deflection of more than 10 degrees in either the vertical or horizontal plane after the wind load has been removed from the front of the signal face or deflection of more than 6 degrees in either the vertical or horizontal plane after the wind load has been removed from the back of the signal face

Replace the 1st sentence of section 86-4.01A(1) with:

07-19-13

Each metal housing must have a metal visor.

Replace the 1st sentence of section 86-4.01A(2) with:

07-19-13

Each plastic housing must be molded in 1 piece or fabricated from 2 or more pieces and joined into a single piece.

Delete item 1 in the list in section 86-4.01D(1)(b).

07-19-13

Replace the paragraphs in section 86-4.01D(1)(c)(i) with:

07-19-13

LED signal modules must be on the Authorized Material List for LED traffic signals.

The Department tests modules under section 86-2.14A, ANSI/ASQ Z1.4, and:

1. California Test 604 for LED and circular LED signal modules
2. California Test 3001 for arrow, U-turn, and bicycle LED signal modules

The LED signal modules submitted for testing must be typical production units. LEDs must be spread evenly across the module.

The Department may test the modules on all parameters specified in section 86-4.01D.

Replace the 1st and 2nd sentences of the 3rd paragraph of 86-4.01D(2)(b) with:

The electrical connection for each flashing LED signal module must be 4 secured, color-coded, jacketed copper wires. The wire must comply with the NEC. 07-19-13

Replace the heading of section 86-4.02 with:

PROGRAMMED VISIBILITY VEHICLE SIGNAL SECTION

07-19-13

Replace "face" in the 1st paragraph of section 86-4.02 with:

section

07-19-13

Add before the 1st sentence in section 86-4.03A:

The pedestrian signal face must be Type A.

07-19-13

Replace the 1st sentence of the 2nd paragraph of section 86-4.03B with:

The Department tests the pedestrian signal's front screen in a horizontal position with its edges supported.

07-19-13

Delete items 1 and 4 in the list in section 86-4.03I(1)(b).

07-19-13

Replace the paragraphs of section 86-4.03I(1)(c)(i) with:

The LED PSF module must be on the Authorized Material List for LED traffic signals.

07-19-13

The Department tests LED PSF modules under section 86-2.14A, ANSI/ASQ Z1.4, and California Test 606.

The LED PSF modules submitted for testing must be representative of typical production units.

The Department may test the modules on all parameters specified in section 86-4.03I.

Replace item 1 in the list in the 1st paragraph of section 86-4.03I(2) with:

1. Not include reflectors.

07-19-13

Replace item 6 in the list in the 1st paragraph of section 86-4.03I(2) with:

07-19-13

6. Be able to replace signal lamp optical units and pedestrian signal faces with LEDs.

Replace the table titled "Chromaticity Standards (CIE Chart)" in the 16th paragraph of section 86-4.03I(2) with:

07-19-13

Chromaticity Standards (CIE Chart)

Upraised hand	X: not greater than 0.659 or less than 0.600 Y: not greater than 0.390 or less than 0.331 Y= 0.990-X
Walking person	X: not greater than 0.440 or less than 0.280 Y: not greater than 0.0483 + 0.7917(X) or less than 0.0983 + 0.7917(X)

Add between "beacon" and "must" in the 1st sentence of section 86-4.05:

07-19-13

signal face

Delete "face" in item 1 in the list in the 1st paragraph of section 86-4.05.

07-19-13

Replace the row for viscosity in the table in the 2nd paragraph of section 86-5.01A(3)(c) with:

07-19-13

Viscosity, Brookfield Thermosel, no. 27 Spindle, 20 rpm, 190 °C	D 4402	2.5–3.5 Pa·s
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Replace the paragraph in section 86-5.01A(3)(d) with:

07-19-13

Use epoxy sealant for repair work in and around sawcuts housing inductive loops.

Replace "all loop conductors" in the 3rd paragraph of section 86-5.01A(4) with:

07-19-13

the detector lead-in cable

Replace "Encase the loop wires" in the 1st sentence of the 3rd paragraph of section 86-5.01A(5) with:

07-19-13

The loop wires must be encased

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

10-19-12

Puncture strength, lb min	ASTM D 6241	310
Trapezoid tearing strength, lb min	ASTM D 4533	56

Replace the 3rd paragraph in section 88-1.02C with:

10-19-12

Geocomposite wall drain must be from 0.25 to 2 inches thick.

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

01-20-12

0.05

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

01-20-12

0.012

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

01-20-12

Sediment Filter Bag

Property	Test	Values	
		Woven	Nonwoven
Grab breaking load, lb, 1-inch grip min, in each direction	ASTM D 4632	200	250
Apparent elongation, percent min, in each direction	ASTM D 4632	10	50
Water flow rate, gal per minute/sq ft min and max average roll value	ASTM D 4491	100-200	75-200
Permittivity, sec ⁻¹ min	ASTM D 4491	1.0	1.0
Apparent opening size, inches max average roll value	ASTM D 4751	0.023	0.012
Ultraviolet resistance, % min retained grab breaking load, 500 hr.	ASTM D 4355	70	70

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

01-20-12

Temporary Cover

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

Replace section 88-1.02P with:

01-18-13

88-1.02P Biaxial Geogrid

Geosynthetics used for biaxial geogrid must be a punched and drawn polypropylene material formed into an integrally formed biaxial grid. When tested under the referenced test methods, properties of biaxial geogrid must have the values shown in the following table:

Biaxial Geogrid

Property	Test	Value
Aperture size, inch ^a min and max	Calipered	0.8-1.3 x 1.0-1.6
Rib thickness, inch min	Calipered	0.04
Junction thickness, inch min	Calipered	0.150
Tensile strength, 2% strain, lb/ft ^a min	ASTM D 6637	410 x 620
Tensile strength at ultimate, lb/ft ^a min	ASTM D 6637	1,310 x 1,970
Ultraviolet resistance, percent min retained tensile strength, 500 hours	ASTM D 4355	100
Junction strength, lb/ft ^a min	ASTM D 7737	1,220 x 1,830
Overall flexural rigidity, mg-cm min	ASTM D 7748	750,000
Torsional rigidity at 20 cm-kg, mm-kg/deg ^b min	GRI:GG9	0.65

^aMachine direction x cross direction

^bGeosynthetic Research Institute, Test Method GG9, *Torsional Behavior of Bidirectional Geogrids When Subjected to In-Plane Rotation*

Replace section 88-1.02Q with:

07-19-13

88-1.02Q Geosynthetic Bond Breaker

Geosynthetic bond breaker must be nonwoven; needle punched; not heat treated; polypropylene, polyethylene material.

When tested under the referenced test methods, properties of geosynthetic bond breaker material must have the values shown in the following table:

Geosynthetic Bond Breaker		
Property	Test	Value
Mass per unit area, oz/sq yd min	ASTM D 5261	14.7
Thickness at 29 psi, mm min	ASTM D 5199	1.0
Tensile strength at ultimate, lbs/ft min	ASTM D 4595	685
Elongation, percent max	ASTM D 4595	130
Permittivity at 2.9 psi, m/s min	ASTM D 5493	0.0001
Hydraulic transmissivity at 29 psi, m/s min	ASTM D 6574	0.0002
Ultraviolet resistance, percent min retained grab breaking load, 500 hours	ASTM D 4355	60

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90 CONCRETE

07-19-13

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

08-05-11

Submit weighmaster certificates in printed form or, if authorized, in electronic media. Present electronic media in a tab-delimited format on a CD or DVD. Captured data for the ingredients represented by each batch must be line feed carriage return and one line separate record with sufficient fields for the specified data.

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

08-05-11

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

Replace the 1st paragraph of section 90-4.01A with:

07-19-13

Section 90-4 includes specifications for fabricating PC concrete members.

Replace the paragraphs in section 90-4.01C with:

07-19-13

90-4.01C(1) General

For reports and logs, type or clearly print the name next to the signature of the person signing the report or log.

Submit expansion test data under section 90-4.02, if required.

90-4.01C(2) Certificates of Compliance

Submit a certificate of compliance for the cementitious material used in PC concrete members. The certificate must be signed by the PC concrete product manufacturer.

Submit a certificate of compliance for each PC concrete member. The certificate of compliance for tier 1 and tier 2 members must be signed by the QC manager. The certificate of compliance for tier 3 members must be signed by the QC Inspector.

90-4.01C(3) Precast Concrete Quality Control Plan

Before performing any precasting activities for tier 1 and tier 2 PC concrete members, submit 3 copies of the project-specific QC plan for the PC plant. The QC plan must supplement the information from the authorized facility audit. Submit a separate QC plan for each plant. Allow 25 days for review.

Each project-specific QC plan must include:

1. Name of the precasting plant, concrete plants, and any testing laboratory to be used.
2. Manual prepared by the precasting plant that includes:
 - 2.1. Equipment description
 - 2.2. Testing procedures
 - 2.3. Safety plan
 - 2.4. Personnel names, qualifications, and copies of certifications
3. QC manager and QC inspector names, qualifications, and copies of certifications.
4. Organizational chart showing QC personnel and their assigned QC responsibilities.
5. Methods and frequencies for performing QC procedures including inspections, material testing, and any survey performed for all components of PC concrete members. Components include prestressing, concrete, grout, reinforcement, steel, miscellaneous metal, and formwork.
6. System for reporting noncompliant PC concrete members to the Engineer.
7. System for identification and tracking repairs and repair methods.
8. Procedure for the reinspection of repaired PC concrete members.
9. Forms for certificates of compliance, daily production logs, and daily reports.

Submit a revised QC plan for any changes to:

1. Concrete plants
2. Material sources
3. Material testing procedures
4. Testing laboratory
5. Procedures and equipment
6. Updated systems for tracking and identifying PC concrete members
7. QC personnel

After authorization, submit 7 copies of each authorized QC plan and make 1 copy available at each location where work is performed.

Allow 7 days for review of a revised QC plan.

90-4.01C(4) Daily Production Log

The QC inspector must provide reports to the QC manager for each day that precasting activities are performed.

The QC manager must maintain a daily production log of PC activities for each day's precasting. PC activities include setting forms, placing reinforcement, setting prestressing steel, casting, curing, post

tensioning, and form release. This daily log must be available at the precasting plant. The daily log must include:

1. Plant location
2. Specific description of casting or related activities
3. Any problems or deficiencies discovered
4. Any testing or repair work performed
5. Names of QC inspectors and the specific QC inspections they performed that day
6. Reports for that day's precasting activities from each QC inspector including before, during, and after precast inspections

Immediately notify the Engineer when any precasting problems or deficiencies are discovered, and submit the proposed repair or process changes necessary to correct them.

90-4.01C(5) Precast Concrete Report

Before shipping PC concrete members, submit a PC concrete report. The report must include:

1. Reports of all material tests and any survey checks
2. Documentation that:
 - 2.1. You have evaluated all tests
 - 2.2. You corrected all rejected deficiencies
 - 2.3. Repairs have been reexamined with the required tests and found acceptable
3. Daily production logs
4. Certificates of compliance
5. Documentation of inspections

Each person who performs a material test or survey check must sign the corresponding report and submit the report directly to the QC manager.

Replace the paragraphs in section 90-4.01D with:

07-19-13

90-4.01D(1) General

Quality control and assurance for PC concrete includes:

1. Your QC program
2. Department's acceptance of PC concrete members

PC concrete members are categorized into the following 4 tiers:

1. Tier 1 consists of:
 - 1.1. Components of bridge structures, including girders, deck panels, bent caps, abutments, slabs, closure wall panels, and piling
 - 1.2. Prestressed pavement
2. Tier 2 consists of:
 - 2.1. Components of earth retaining systems
 - 2.2. Wingwalls
 - 2.3. Types A, B, and C pipe culvert headwalls, endwalls, and wingwalls
 - 2.4. Pavement
 - 2.5. Box culverts
 - 2.6. Sound wall panels and supports
3. Tier 3 consists of:
 - 3.1. Pipes
 - 3.2. Pipe drainage facilities
 - 3.3. Straight and "L" pipe culvert headwalls except those listed under tier 2
 - 3.4. Drainage Inlets
 - 3.5. Flared end sections
4. Tier 4 consists of any member not described as tier 1, tier 2, or tier 3

90-4.01D(2) Quality Control

90-4.01D(2)(a) General

For tier 1 and tier 2 PC concrete members:

1. Fabricate PC concrete members at a plant on the Authorized Facility Audit List
2. Assign a PC concrete QC manager to the plant
3. Assign a QC inspector who is either registered as a civil engineer in the State or:
 - 3.1. For tier 1, has a Plant Quality Personnel Level II certification from the Precast/Prestressed Concrete Institute
 - 3.2. For tier 2, has a Plant Quality Personnel Level I certification from the Precast/Prestressed Concrete Institute
4. Prepare a PC concrete QC plan
5. Perform PC concrete materials testing
6. Maintain a daily production log
7. Prepare a PC concrete report
8. Prepare a certificate of compliance

For tier 3 PC concrete members:

1. Assign a QC inspector who has one of the following qualifications:
 - 1.1. Registration as a civil engineer in the State.
 - 1.2. Plant Quality Personnel, Level I certification from the Precast/Prestressed Concrete Institute.
 - 1.3. Competency to perform inspection of PC operations. An inspector is competent if the individual has completed training or has experience in PC operations and inspection.
2. Prepare a certificate of compliance

For tier 4 PC concrete members, prepare a certificate of compliance.

For each ASTM test method specified in this section, the material's test result must comply with the requirement specified for the comparable test in section 90 unless otherwise specified.

If curing compound is used, provide certificate of compliance as specified in section 90-1.01C(5).

If PC concrete is manufactured at an established PC concrete plant, a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures under section 90-1.01D(5)(b) are not required.

90-4.01D(2)(b) Quality Control Meeting

After submitting the PC concrete QC plan, hold a meeting to discuss the requirements for PC concrete QC. The meeting attendees must include the Engineer, the PC concrete QC manager, and a representative from each plant performing PC concrete activities for the Contract.

90-4.01D(2)(c) Sampling, Testing, and Inspecting

The QC laboratory testing personnel or the QC inspector must witness sampling. The QC laboratory testing personnel must perform testing.

QC laboratory testing personnel must have the following certifications, as applicable:

1. ACI Strength Testing Technician
2. ACI Concrete Laboratory Testing Technician Level 1
3. ACI Aggregate Testing Technician Level 2

The QC Inspector must perform inspections before, during, and after casting is complete.

QC field testing and inspection personnel must have an ACI Concrete Field Testing Technician, Grade I certification.

For each mix design used for tier 1 and tier 2 PC concrete members, perform sampling and testing at the minimum frequencies shown in the following tables:

Aggregate QC Tests

Property	Test method	Minimum testing frequency
Aggregate gradation	ASTM C136	Once per 400 cu yd of concrete cast or once a week, whichever is more frequent
Sand equivalent	ASTM D2419	
Percent fines under 75 microns ^a	ASTM C117	
Moisture content of fine aggregate	ASTM C566, or electronically actuated moisture meter ^b	1–2 times per each day of pour, depending on conditions

^aPercent fines under 75 microns test replaces the cleanliness test in section 90-1.02C with the requirements of 1.5 percent maximum for "Operating Range" and 2.0 percent maximum for "Contract Compliance." The 5th paragraph of section 90-1.02C(2) does not apply.

^bElectronically actuated moisture meter must be calibrated once per week per ASTM C566.

Concrete QC Tests

Property	Test method	Minimum testing frequency
Compressive strength ^b	ASTM C172/C172M, ASTM C31/C31M, and ASTM C39/C39M	Once per 100 cu yd of concrete cast, or every day of casting, whichever is more frequent
Slump	ASTM C143/C143M	
Temperature	ASTM C1064/C1064M	
Density	ASTM C138	Once per 600 cu yd of concrete cast or each week of batching, whichever is more frequent
Air content	ASTM C231/C231M or ASTM C173/C173M ^a	If concrete is air entrained, once for each set of cylinders, and when conditions warrant

^aASTM C173/C173M must be used for lightweight concrete.

^bCylinders must be 6 by 12 inches.

If concrete is batched at more than 1 plant, perform the tests at each plant.

Cure test cylinders for determining time of prestressing loading in the same manner as the concrete in the member.

Cure test cylinders for determining compliance with 28-day strength requirements in the same manner as the member until completion of the steam curing process followed by a water bath or moist room at 60 to 80 degrees F until tested.

92 ASPHALTS

07-19-13

Replace "Reserved" in section 92-1.01B with:

07-19-13

modified asphalt binder: Asphalt binder modified with polymers, crumb rubber, or both.

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

01-20-12

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

Replace 2nd paragraph of section 92-1.02B with:

07-19-13

PG modified asphalt binder must comply with the requirements shown in the following table:

PG Modified Asphalt Binder

Property	AASHTO Test Method	Grade		
		PG 58-34 M	PG 64-28 M	PG 76-22 M
Original Binder				
Flash point, min °C	T 48	230	230	230
Solubility, min %	T 44 ^a	97.5	97.5	97.5 ^b
Viscosity at 135 °C ^c , max, Pa·s	T 316	3.0	3.0	3.0
Dynamic shear, Test temperature at 10 rad/s, °C min G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO test ^d , Mass loss, max, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic shear, Test temperature at 10 rad/s, °C min G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic shear, Test temperature at 10 rad/s, °C max (delta), degree	T 315	80 ^e	80 ^e	80 ^e
Elastic recovery, Test temperature °C min recovery, %	T 301	25 75	25 75	25 65
PAV ^g , temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic shear, Test temperature at 10 rad/s, °C max G*/sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep stiffness, Test temperature, °C max S-value, MPa min M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

^aThe Department allows ASTM D 5546 or ASTM D 7753 instead of AASHTO T 44. Particles recovered from ASTM D 5546 or ASTM D 7753 or AASHTO T 44 must be less than 250 µm.

^bReport only for spray application.

^cThe Engineer waives this specification if the supplier provides written certification the asphalt can be adequately pumped and mixed at temperatures meeting applicable safety standards.

^d"RTFO Test" means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T 240 or ASTM D 2872. The residue from mass change determination may be used for other tests.

^eTest temperature is the temperature at which $G^*/\sin(\delta)$ is 2.2 kPa. A graph of $\log G^*/\sin(\delta)$ plotted against temperature may be used to determine the test temperature when $G^*/\sin(\delta)$ is 2.2 kPa. A graph of (δ) versus temperature may be used to determine δ at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa. The graph must have at least two points that envelope $G^*/\sin(\delta)$ of 2.2 kPa and the test temperature must not be more than 6 degree C apart. The Engineer also accepts direct measurement of (δ) at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa.

^fTests without a force ductility clamp may be performed.

^g"PAV" means "Pressure Aging Vessel."

Do not modify PG modified asphalt binder using polyphosphoric acid.

Crumb rubber must be from automobile and truck tires and must be free from contaminants including fabric, metal, minerals, and other nonrubber substances.

PG modified asphalt binder modified with crumb rubber must be homogeneous and must not contain visible particles of crumb rubber.

The supplier of PG modified asphalt binder modified with crumb rubber must:

1. Report the amount of crumb rubber by weight of asphalt binder
2. Certify a minimum of 10 percent of crumb rubber by weight of asphalt binder

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93 LIQUID ASPHALTS

07-19-13

Replace "Celsius" the 1st row in the table in the 8th paragraph of section 93-1.04 with:

Fahrenheit

07-19-13

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94 ASPHALTIC EMULSIONS

03-21-14

Replace the 1st paragraph of section 94-1.04 with:

Asphaltic emulsion is measured by weight under the specifications requiring its use. If water is added to the asphaltic emulsion, the quantity of asphaltic emulsion is determined before the addition of water.

03-21-14